Geotechnical Data Report

Calais BHF 037-2 (10)
Vermont Route 14, Bridge 74 Over Pekin Brook
Calais, Vermont
PIN: 11a218
May 01, 2014
Terracon Project No. J1145111

Prepared for:
Vermont Agency of Transportation
Montpelier, Vermont

Prepared by:
Terracon Consultants, Inc.
Manchester, New Hampshire

May 01, 2014

Terracon

Vermont Agency of Transportation
Materials and Research
One National Life Drive
Montpelier, Vermont 05633

Attn: Mr. Christopher Benda, PE
P: [802] 828-6910
E: chris.benda@state.vt.us

Re: Geotechnical Data Report
Calais BHF 037-2 (10)
Vermont Route 14, Bridge 74 Over Pekin Brook
Calais, Vermont
PIN: 11a218
May 1, 2014
Terracon Project No. J1145111

Dear Mr. Benda:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering services for the above referenced project. This study was performed in general accordance with our proposal number PJ1140027 dated February 13, 2014. This report presents the findings of the subsurface exploration and laboratory testing for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Anant Panwalkar
Senior Project Engineer, P.E.

STATE OF VERMONT
LAWRENCE JAMES DWYER
NO.018-0008265
Civil
LICENSED
PROFESSIONAL ENGINEER

Lawrence J. Dwyer, P.E.
Principal

Enclosures
cc: 1 – Client (PDF)
1 – File

GEOTECHNICAL DATA REPORT
Calais BHF 037-2 (10)
Vermont Route 14, Bridge 74 Over Pekin Brook
CALAIS, VERMONT

PIN:11a218
Terracon Project No. J1145111
May 1, 2014

1.0 INTRODUCTION

This geotechnical data report presents the results of our geotechnical exploration performed for the proposed replacement of Bridge No. 74 carrying Vermont Route 14 over Pekin Brook in Calais, Vermont.

Our geotechnical engineering scope of services included advancing two test borings, designated B-1 and B-2, as identified on the Geotechnical Services Request Form prepared by Vermont Agency of Transportation (VAOT). The scope included two borings drilled to a maximum of 100 feet with rock cores taken if refusal was encountered within 50 feet. Terracon finalized the boring depths and sampling intervals in general accordance with the VAOT guidelines "MREI 11-01 Geotechnical Guidelines for the Subsurface Investigation Process" and our discussions with VAOT staff. Subsequently, the scope was modified during drilling program to extend the borings and to obtain confirmatory bedrock cores. B-1 was terminated in weathered bedrock at 109 feet. B-2 was re-drilled 5 feet south of original location to obtain a confirmatory bedrock core and terminated in bedrock at 126 feet depth.

Site Location Map is included on Exhibit A-1 in Appendix A. The boring locations are shown on Exhibit A-2: Exploration Location Plan and Geologic Cross Section in Appendix A.

2.0 PROJECT INFORMATION

2.1 Project Description

Item	Description
Site layout	See Appendix A, Exhibit A-2: Exploration Location Plan and Geologic Cross Section.
Structure	The project consists of replacing existing 34.8 feet long and 44 feet wide concrete T-beam Bridge 74 carrying Vermont 14 over Pekin Brook in Calais, Vermont.
Cut and fill slopes	Minimum cut and fill slopes are anticipated.

Item	Description
Finish Elevation	Anticipated to be similar grade as the existing bridge and roadways.

2.2 Site Location and Description

Item	Description
Location	The subject bridge is located approximately 100 feet south of the intersection of Vermont Route 14 and Pekin Brook Road in Calais, Vermont.
Existing improvements	Existing concrete t-beam bridge constructed circa 1928 and re-constructed in 1981.
Current ground cover	Paved roadway.
Existing topography	Roadway elevation (EI) approximately EI 717 feet. Streambed approximately EI 708 feet. Neglible grade difference from one side of the bridge to the other.

3.0 SUBSURFACE CONDITIONS

3.1 Geology

A preliminary report prepared by AOT provided a summary of available geological information. Based on the information provided in the preliminary report and the Surficial Geology Map of Vermont, the subsurface soils consist of deep deposits of alluvial sands overlying silt-clay and clay. Bedrock Geology Map of Vermont 2011 indicates bedrock is part of the Waits River Formation and likely consists of carbonaceous phyllite and limestone.

3.2 Typical Profile

Based on the results of the borings, subsurface conditions can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description	Consistency/ Density
Bituminous Pavement	0.5	N/A	N/A
Fill	4.0 to 6.0	Fine to coarse sand, little silt. Brown, dry.	Loose to very dense.
Sand with Silt	14.0 to 16.0	Well sorted sand, little silt, gray, wet.	Very loose to medium dense.

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description	Consistency/ Density
Silt	105.0 to 115.0	Silt, trace sand, trace clay at deeper depths, gray, wet.	Very soft to stiff.
Sand and Silt	121.0	Fine grained sand and silt, gray, wet.	Dense
Weathered Bedrock	121.5 (B-2)	Gray, highly weathered rock, wet.	N/A.
Bedrock	N/A	Gray, whitish muscovite-biotite-quartz phyllite, tight joints dipping from 0 to 55 degrees.	moderately hard to hard

Interpreted subsurface profile along the bridge centerline is presented on Exhibit A-2 in Appendix A. Conditions encountered at each boring location are indicated on the individual boring logs. Stratification boundaries on the exploration logs represent the approximate location of changes in soil types; in situ, the transition between materials may be gradual. Details for each of the explorations can also be found on the logs in Appendix A of this report.

3.3 Groundwater

Explorations were observed during drilling for the presence of groundwater. Observed groundwater depths varied from 16.0 feet at B-1 to 9.0 feet at B-2 (El 705 feet to El 711 feet) at the time of drilling. Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, brook elevation, and other factors not evident at the time the explorations were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. Groundwater level fluctuations should be considered when developing the design and construction plans for the project.

3.4 Laboratory Testing

Laboratory testing was performed on soil samples obtained from the test borings to assist in classification and evaluate engineering properties. Laboratory testing was performed by VAOT staff in the VAOT facility located in Berlin, Vermont. The results of the laboratory tests are presented in Appendix B of this report.

4.0 GENERAL COMMENTS

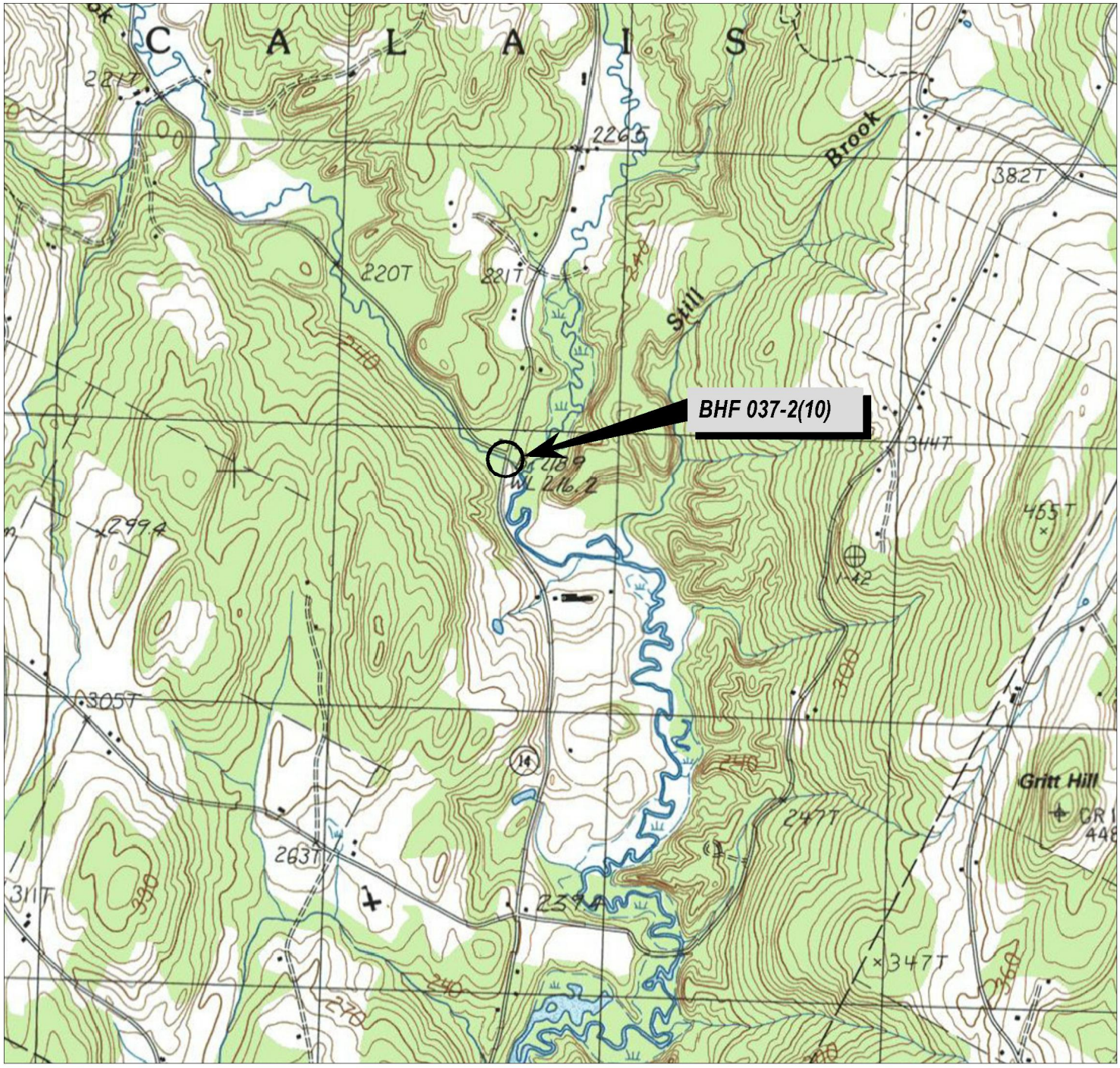
The interpretations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the

modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

APPENDIX A
FIELD EXPLORATION



SCALE: 1:24 000

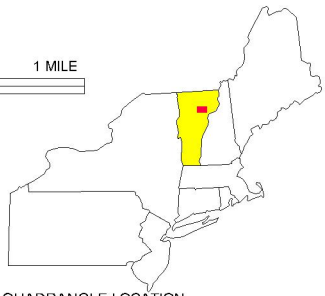
1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

CONTOUR INTERVAL 6 METERS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

N



QUADRANGLE LOCATION
SOURCE:
USGS PLAINFIELD, VT
1986

Project Mngr:	ASP
Drawn By:	MCR
Checked By:	ASP
Approved By:	LJD

Project No.	J1145111
Scale:	AS SHOWN
File No.	J1145111.dwg
Date:	April 2014

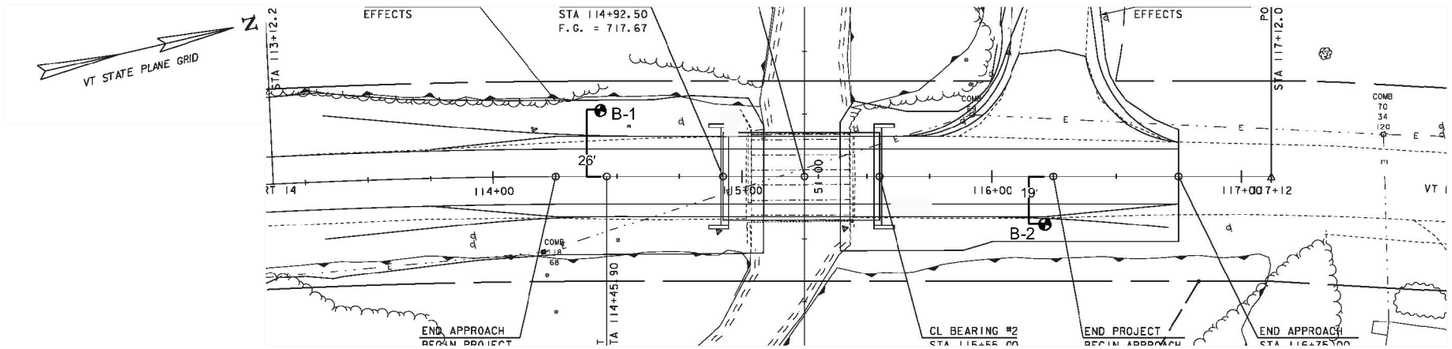
Terracon
77 Sundial Ave. Manchester, NH 03103
PH. (603)647-9700 FAX (603) 647-4432

SITE LOCATION MAP

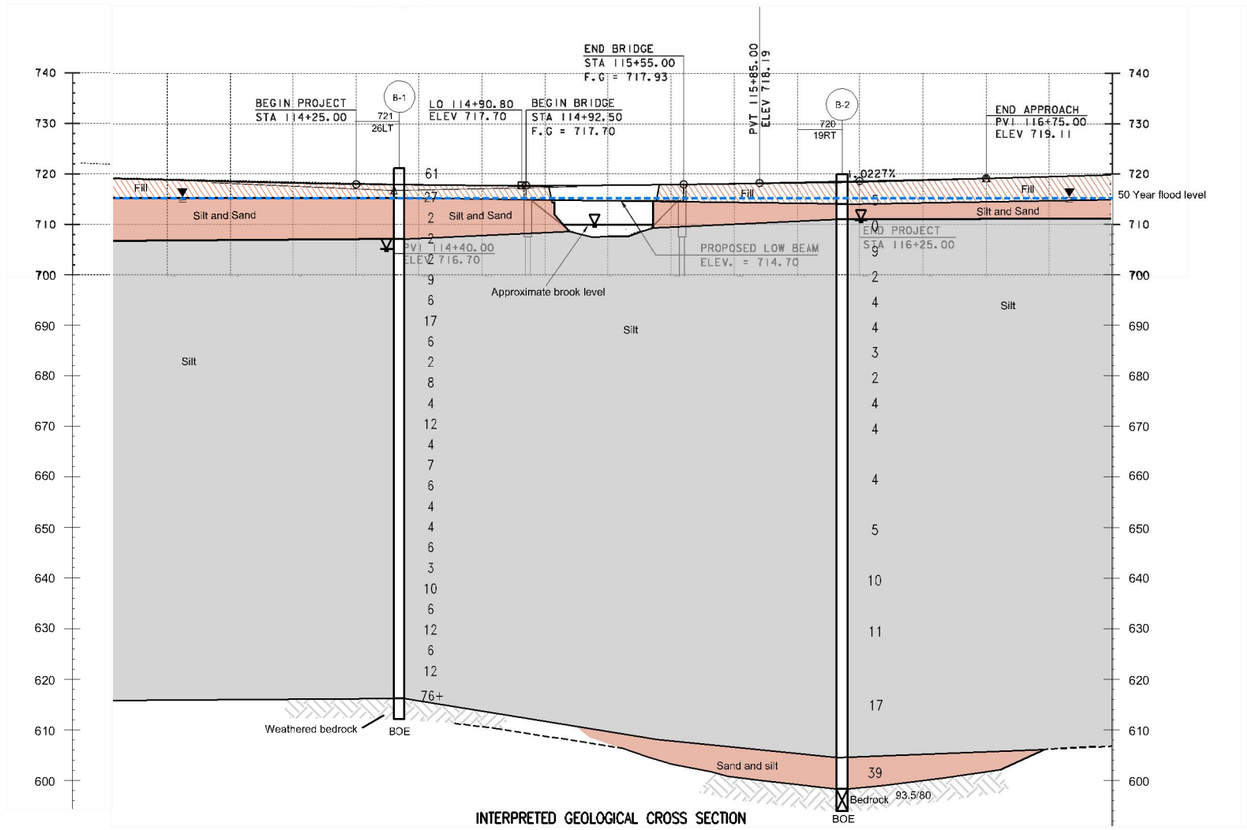
VT Route 14, Bridge 74 Over Pekin Brook
CALAIS, VERMONT
BHF 037-2(10)

EXHIBIT

A-1



EXPLORATION LOCATION PLAN



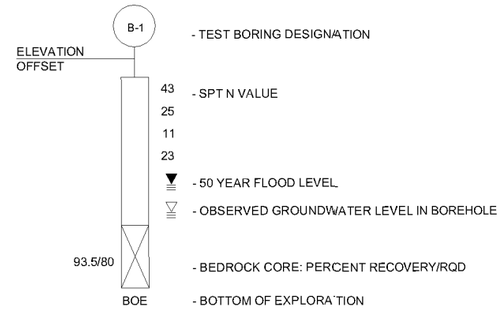
INTERPRETED GEOLOGICAL CROSS SECTION

HORIZONTAL SCALE
7.5 0 7.5 15 30
(IN FEET)

VERTICAL SCALE
15 0 15 30 60
(IN FEET)

BORING CHART

BORING	STATION	OFFSET	NORTHING	EASTING
B-1	114.375	26.00LT	1654568.0392	Y=668328.0399
B-2	116.150	19.00RT	1654651.2557	Y=668489.6772



NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A PLAN PROVIDED BY THE VERMONT AGENCY OF TRANSPORTATION.

2. TEST BORINGS SHOWN AS B-1 AND B-2 WERE ADVANCED ON MARCH 10 THROUGH MARCH 19, 2014 UNDER THE DIRECTION OF TERRACON WITH EQUIPMENT OWNED AND OPERATED BY DRILEX OF WEST BOYLSTON, MA. TEST BORING B-2 WAS REDRILLED ON APRIL 9 AND 10, 2014 UNDER THE DIRECTION OF TERRACON WITH EQUIPMENT OWNED AND OPERATED BY CRAWFORD DRILLING.

3. DATA CONCERNING THE VARIOUS STRATA HAVE BEEN INTERPOLATED AT BORING LOCATIONS ONLY. THE STRATIGRAPHY BETWEEN BORINGS MAY VARY FROM THAT SHOWN.

4. THE APPROXIMATE LOCATIONS OF THE TEST BORINGS WERE LOCATED BY MEASURING FROM EXISTING SITE FEATURES. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE TO THE DEGREE IMPLIED BY THE METHOD USED.

5. USE OF THIS PLAN IS LIMITED TO THE ILLUSTRATION OF THE APPROXIMATE LOCATION OF THE TEST BORINGS AND OTHER PERTINENT SITE FEATURES. OTHER USE OF THIS PLAN WITHOUT PERMISSION FROM TERRACON IS PROHIBITED.

VTrans Working to Get You There
Vermont Agency of Transportation

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

Terracon
77 Sundial Ave. Manchester, NH 03103
PH. (603)647-9700 FAX (603) 647-4432

EXHIBIT A-2

EXPLORATION LOCATION PLAN AND GEOLOGIC CROSS SECTION

Project Name: VT Route 14, Bridge 74 Over Pekin Brook
Location: Calais, Vermont
Number: BHF 037-2(10)

N:\PROJECTS\2014\J1145111\Working Files\Diagrams-Drawings-Figures\J1145111.DWG

Field Exploration Description

Two test borings were completed at the site from March 10, 2014 through April 10, 2014. Terracon personnel monitored the advancement of the soil borings within the project site. Soil borings were advanced using an all-terrain vehicle mounted rotary drill rig, owned and operated by Drillex Environmental of West Boylston, Massachusetts and Crawford Drilling Services of Gardner, MA. B-1 and B-2 were advanced using mud rotary or drive-and-wash drilling methods to depths of 109 to 126 feet below existing grade, respectively. B-2 was re-drilled using drive and wash and NX core to obtain confirmatory rock core.

The proposed boring locations were laid out in the field by a Terracon representative using a scaled site plan provided by Vermont Agency of Transportation (VAOT) and field ties. Ground surface elevations indicated on the boring logs were estimated based on the grading plan provided by VAOT. The locations and elevations of the borings should be considered accurate only to the degree implied by the means and methods used to define them.

Samples of the soil encountered in the borings were obtained using the split-barrel sampling procedures. In the split-barrel sampling procedure, the number of blows required to advance a standard 2-inch O.D. split-barrel sampler the last 12 inches of the typical total 18-inch penetration by means of a 140-pound hammer with a free fall of 30 inches, is the standard penetration resistance value (SPT-N). This value is used to estimate the in-situ relative density of cohesionless soils and consistency of cohesive soils.

The samples were tagged for identification, sealed to reduce moisture loss, and taken to the VAOT laboratory for further examination, testing, and classification. Information provided on the boring logs attached to this report includes soil descriptions, consistency evaluations, boring depths, sampling intervals, and groundwater conditions. The borings were backfilled with cuttings prior to the drill crew leaving the site.

A field log of each boring was prepared by the Terracon field engineer. These logs included visual classifications of the materials encountered during drilling as well as the field engineer's interpretation of the subsurface conditions between samples. Final boring logs included with this report represent the engineer's interpretation of the field logs and include modifications based on laboratory observation and tests of the samples.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

VT Route 14, Bridge 74 Over Pekin Brook
Calais, Vermont
BHF 037-2(10)

Boring No.: **B-1**
Page No.: 1 of 3
Pin No.: s12b144
Checked By: ASP

Boring Crew: Drilex, JDF
Date Started: 3/10/14 Date Finished: 3/11/14
VTSPG NAD83: N 1654568.04 ft E 668328.04 ft
Station: 114.375 Offset: 26.00LT
Ground Elevation: 721.0 ft

	Casing	Sampler
Type:	Steel	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:		Auto/N
Rig:	CME 85 Truck	C_E = 1.33

Groundwater Observations

Date	Depth (ft)	Notes
03/10/14	16.0	While sampling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-1-b, GrSa, dark brown, Rec. = 1.58 ft, (FILL)	11-28-33-22 (61)	14.1	28.0	53.3	18.7
		A-1-b, GrSa, brown, Rec. = 0.92 ft, (FILL)	15-18-9-3 (27)	8.8	30.5	52.6	16.9
5		A-2-4, SiSa, gray-brown, Rec. = 0.25 ft, (FILL)	2-1-1-2 (2)	23.3	14.4	60.2	25.4
		A-4, SiSa, dark brown, Rec. = 0.17 ft	1-1-1-1 (2)	29.5	5.0	56.6	38.4
		A-4, GrSiSa, brown/dark brown, Rec. = 0.5 ft	1-1-1-1 (2)	26.7	22.1	40.2	37.7
10		A-4, SiSa, brown/dark brown, Rec. = 1.33 ft	3-5-4-4 (9)	25.0	15.5	43.5	41.0
		A-4, SaSi, gray-brown, Rec. = 1.0 ft	3-4-2-2 (6)	35.3	3.8	47.9	48.3
15		A-4, SiSa, gray-brown, Rec. = 0.0 ft	8-8-9-9 (17)				
		A-4, Si, gray, Rec. = 1.17 ft	3-3-3-3 (6)	30.8	4.7	11.9	83.4
		A-4, Si, gray, Rec. = 1.58 ft	1-1-1-2 (2)	36.1	0.3	1.6	98.1
20		A-4, Si, gray, Rec. = 0.83 ft	12-6-2-2 (8)	28.5	1.2	5.4	93.4
		A-4, Si, gray, Rec. = 0.83 ft	3-2-2-3 (4)	31.8	1.1	5.6	93.3
25		A-4, Si, gray, Rec. = 1.17 ft	8-7-5-4 (12)	29.8		1.7	98.3
30		A-4, Si, gray, Rec. = 1.58 ft	4-2-2-2 (4)	34.1		1.0	99.0
35		A-4, Si, gray, Rec. = 1.58 ft	5-4-3-3 (7)	34.6		0.7	99.3
40		A-4, Si, gray, Rec. = 1.67 ft	5-4-2-2 (6)	31.7		0.8	99.2
45		A-4, Si, gray, Rec. = 1.83 ft	3-2-2-4 (4)	39.1		0.6	99.4
		Shelby tube sample, Rec. = 0.0 ft					

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated.
Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.
4. Ground surface elevations indicated on the boring logs were estimated based on the grading plan provided by VAOT.

Terracon

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STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

VT Route 14, Bridge 74 Over Pekin Brook
Calais, Vermont
BHF 037-2(10)

Boring No.: **B-1**
Page No.: 2 of 3
Pin No.: s12b144
Checked By: ASP

Boring Crew: Drilex, JDF
Date Started: 3/10/14 Date Finished: 3/11/14
VTSPG NAD83: N 1654568.04 ft E 668328.04 ft
Station: 114.375 Offset: 26.00LT
Ground Elevation: 721.0 ft

	Casing	Sampler
Type:	Steel	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:		Auto/N
Rig:	CME 85 Truck	C_E = 1.33

Groundwater Observations

Date	Depth (ft)	Notes
03/10/14	16.0	While sampling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-4, Si, gray, Rec. = 1.17 ft	4-2-2-2 (4)	34.3		1.0	99.0
55		A-4, Si, gray, Rec. = 1.5 ft	4-4-2-3 (6)	30.8		6.1	93.9
60		A-4, Si, gray, Rec. = 1.83 ft	1-1-2-2 (3)	29.9		1.6	98.4
65		A-4, Si, gray, Rec. = 2.0 ft	4-5-5-4 (10)	34.4		1.0	99.0
70		A-4, Si, gray, Rec. = 0.75 ft	3-3-3-4 (6)	34.9		0.2	99.8
75							
80							
85		A-4, Si, gray, Rec. = 1.5 ft	5-6-6-5 (12)	30.9		1.2	98.8
90							
95		A-4, Si, gray, Rec. = 1.58 ft	3-3-3-5 (6)	33.5		3.1	96.9
		A-4, Si, gray, Rec. = 1.75 ft	5-6-6-7	28.1		7.8	92.2

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated.
Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.
4. Ground surface elevations indicated on the boring logs were estimated based on the grading plan provided by VAOT.

Terracon

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STATE OF VERMONT
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MATERIALS & RESEARCH SECTION
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BORING LOG

VT Route 14, Bridge 74 Over Pekin Brook
Calais, Vermont
BHF 037-2(10)

Boring No.: **B-1**
Page No.: 3 of 3
Pin No.: s12b144
Checked By: ASP

Boring Crew: Drilex, JDF
Date Started: 3/10/14 Date Finished: 3/11/14
VTSPG NAD83: N 1654568.04 ft E 668328.04 ft
Station: 114.375 Offset: 26.00LT
Ground Elevation: 721.0 ft

	Casing	Sampler
Type:	Steel	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:		Auto/N
Rig:	CME 85 Truck	C_E = 1.33

Groundwater Observations

Date	Depth (ft)	Notes
03/10/14	16.0	While sampling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
			(12)				
105		A-4, SaSi, gray, Rec. = 0.83 ft 105.0 ft - 109.0 ft, Weathered bedrock encountered. Difficult drilling from 105' to 109'. Attempted SPT at 109'. SPT refusal encountered at 109'.	14-16-60/2" (76+)	25.0	0.7	31.0	68.3
110		Hole stopped @ 109.0 ft					
115							
120							
125							
130							
135							
140							
145							

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated.
Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.
4. Ground surface elevations indicated on the boring logs were estimated based on the grading plan provided by VAOT.

Terracon

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STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

VT Route 14, Bridge 74 Over Pekin Brook
Calais, Vermont
BHF 037-2(10)

Boring No.: **B-2**
Page No.: 1 of 3
Pin No.: s12b144
Checked By: ASP

Boring Crew: Drilex, JDF
Date Started: 3/17/14 Date Finished: 4/10/14
VTSPG NAD83: N 1654651.26 ft E 668489.68 ft
Station: 116.15 Offset: 19.00RT
Ground Elevation: 720.0 ft

	Casing	Sampler
Type:	Steel	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:		Auto/N
Rig:	CME 85 Truck	C_E = 1.33

Groundwater Observations

Date	Depth (ft)	Notes
03/17/14	9.0	While sampling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
5		A-2-4, SiSa, Dark brown, Rec. = 0.17 ft, (FILL)				4-2-3-4 (5)	17.3	14.7	52.8	32.5
10		A-4, SaSi Sample stuck in casing. (Casing pulled up and collected sample from casing), brown, Rec. = 0.0 ft				0-0-0-0	25.4	0.7	22.0	77.3
15		Rec. = 0.0 ft				6-5-4-2 (9)				
20		A-4, Si, brown/gray, Rec. = 0.58 ft				2-1-1-1 (2)	36.7	3.1	1.1	95.8
25		Rec. = 0.0 ft				2-2-2-2 (4)				
30		A-4, Si, brown/gray, Rec. = 0.25 ft				3-2-2-3 (4)	35.8	3.6	3.4	93.0
35		A-4, Si, gray, Rec. = 1.42 ft				2-1-2-2 (3)	35.5		3.2	96.8
40		A-4, Si, gray, Rec. = 1.42 ft				2-1-1-2 (2)	26.5	0.2	4.4	95.4
45		A-4, Si, gray, Rec. = 1.5 ft				3-2-2-2 (4)	38.6		1.1	98.9
		A-4, Si, gray, Rec. = 1.0 ft				3-2-2-3	35.7		1.9	98.1

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated.
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STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

VT Route 14, Bridge 74 Over Pekin Brook
Calais, Vermont
BHF 037-2(10)

Boring No.: **B-2**
Page No.: 2 of 3
Pin No.: s12b144
Checked By: ASP

Boring Crew: Drilex, JDF
Date Started: 3/17/14 Date Finished: 4/10/14
VTSPG NAD83: N 1654651.26 ft E 668489.68 ft
Station: 116.15 Offset: 19.00RT
Ground Elevation: 720.0 ft

	Casing	Sampler
Type:	Steel	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:		Auto/N
Rig:	CME 85 Truck	C_E = 1.33

Groundwater Observations

Date	Depth (ft)	Notes
03/17/14	9.0	While sampling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
						(4)				
55										
60		A-4, Si, gray, Rec. = 0.83 ft				3-2-2-2 (4)	33.0		3.4	96.6
65										
70		A-4, Si, gray, Rec. = 0.83 ft				3-3-2-2 (5)	29.9		3.0	97.0
75										
80		A-4, Si, gray, Rec. = 1.08 ft				8-5-5-8 (10)	32.3		2.8	97.2
85										
90		A-4, Si, gray, Rec. = 1.08 ft				8-5-6-10 (11)	31.9	5.0	3.2	91.8
95										

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated.
Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.
4. Ground surface elevations indicated on the boring logs were estimated based on the grading plan provided by VAOT.

Terracon

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STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

VT Route 14, Bridge 74 Over Pekin Brook
Calais, Vermont
BHF 037-2(10)

Boring No.: **B-2**
Page No.: 3 of 3
Pin No.: s12b144
Checked By: ASP

Boring Crew: Drilex, JDF
Date Started: 3/17/14 Date Finished: 4/10/14
VTSPG NAD83: N 1654651.26 ft E 668489.68 ft
Station: 116.15 Offset: 19.00RT
Ground Elevation: 720.0 ft

	Casing	Sampler
Type:	Steel	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:		Auto/N
Rig:	CME 85 Truck	C_E = 1.33

Groundwater Observations

Date	Depth (ft)	Notes
03/17/14	9.0	While sampling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
105										
		A-4, Si, gray, Rec. = 0.83 ft				6-6-11-13 (17)	29.7	0.7	2.9	96.4
110										
115		SiSa, gray, 115.0 ft - 119.0 ft				14-18-21-30 (39)	22.8	0.1	52.3	47.6
120		Possible gravel from 119 to 121.5 feet indicated by grinding drilling noise								
		121.5 ft - 126.0 ft, Gray, whitish MUSCOVITE-BIOTITE-QUARTZ PHYLLITE, moderately hard to hard, tight joints (typically fresh to slightly weathered with rust color) dipping from 0° to 55° (typically from 25° to 55° with one horizontal joint).	1	93.5 (79.6)	2.33 1.42 1.42 1.5 0.83					
125										
		On 4/9/2014, relocated boring 5 feet towards the bridge and redrilled from 115 ft. to 126 ft. using Crawford Drilling Services.								
130		Hole stopped @ 126.0 ft								
135										
140										
145										

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated.
Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.
4. Ground surface elevations indicated on the boring logs were estimated based on the grading plan provided by VAOT.

Terracon

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APPENDIX B
LABORATORY TEST RESULTS

Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140344 **Corrected copy:** N/A **Report Date:** 3/14/2014 12:57:42
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 44 FT **to:** 46 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GSH, AL
Comment: S-17

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	
150 µm (#100):	
75 µm (#200):	99.4%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	95.0%
0.02 mm:	70.5%
0.005 mm:	18.0%
0.002 mm:	8.3%
0.001 mm:	6.9%

Limits

T-265 Moisture content: 39.1%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity: 2.757

Gr: 0.0% **D2487:** ML
Sa: 0.6% **M145:** A-4 Silt
Si: 99.4%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

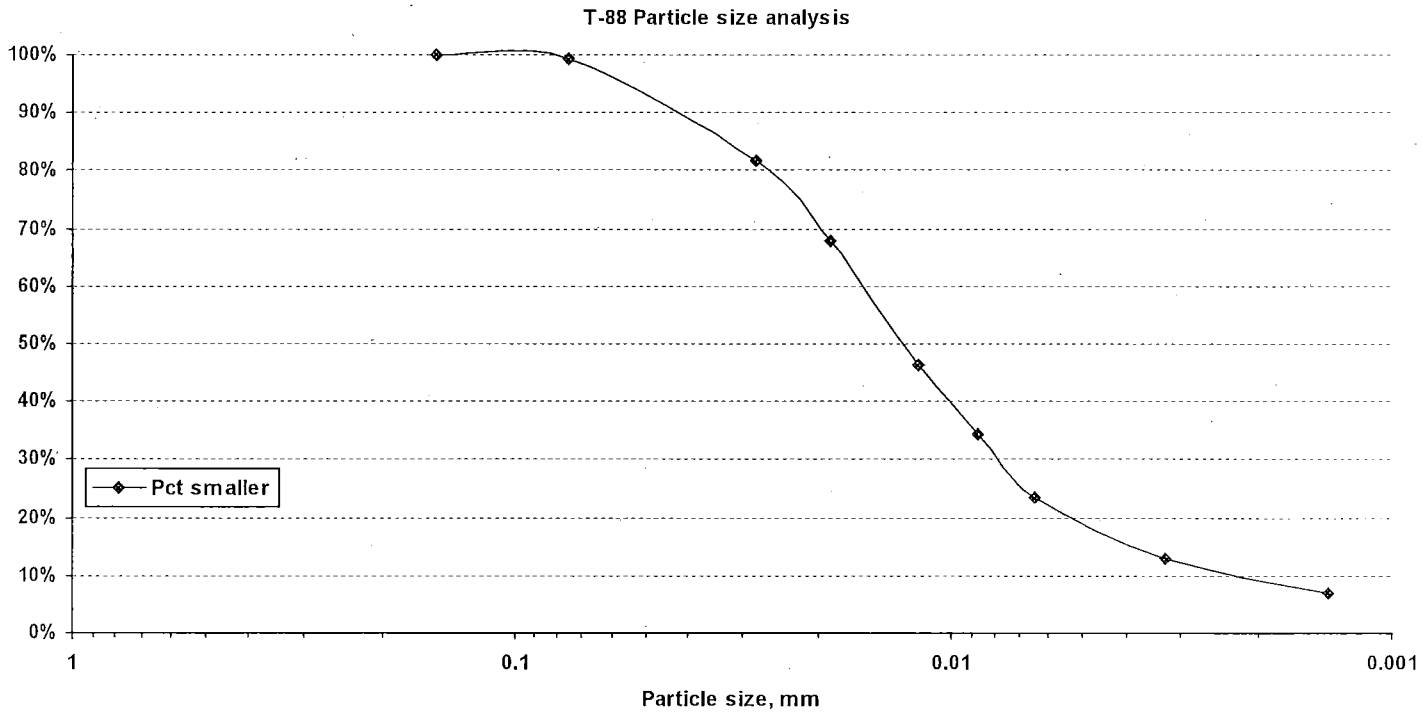
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140344 **Corrected copy:** N/A **Report Date:** 3/14/2014 12:57:53

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 44 FT - 46 FT



Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140347 **Corrected copy:** N/A **Report Date:** 3/14/2014 1:04:52 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 59 FT **to:** 61 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GSH, AL
Comment: S-20

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	
150 µm (#100):	99.8%
75 µm (#200):	98.4%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	89.3%
0.02 mm:	48.7%
0.005 mm:	8.2%
0.002 mm:	3.2%
0.001 mm:	3.0%

Limits

T-265 Moisture content: 29.9%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity: 2.757

Gr: 0.0% **D2487:** ML
Sa: 1.6% **M145:** A-4 Silt
Si: 98.4%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

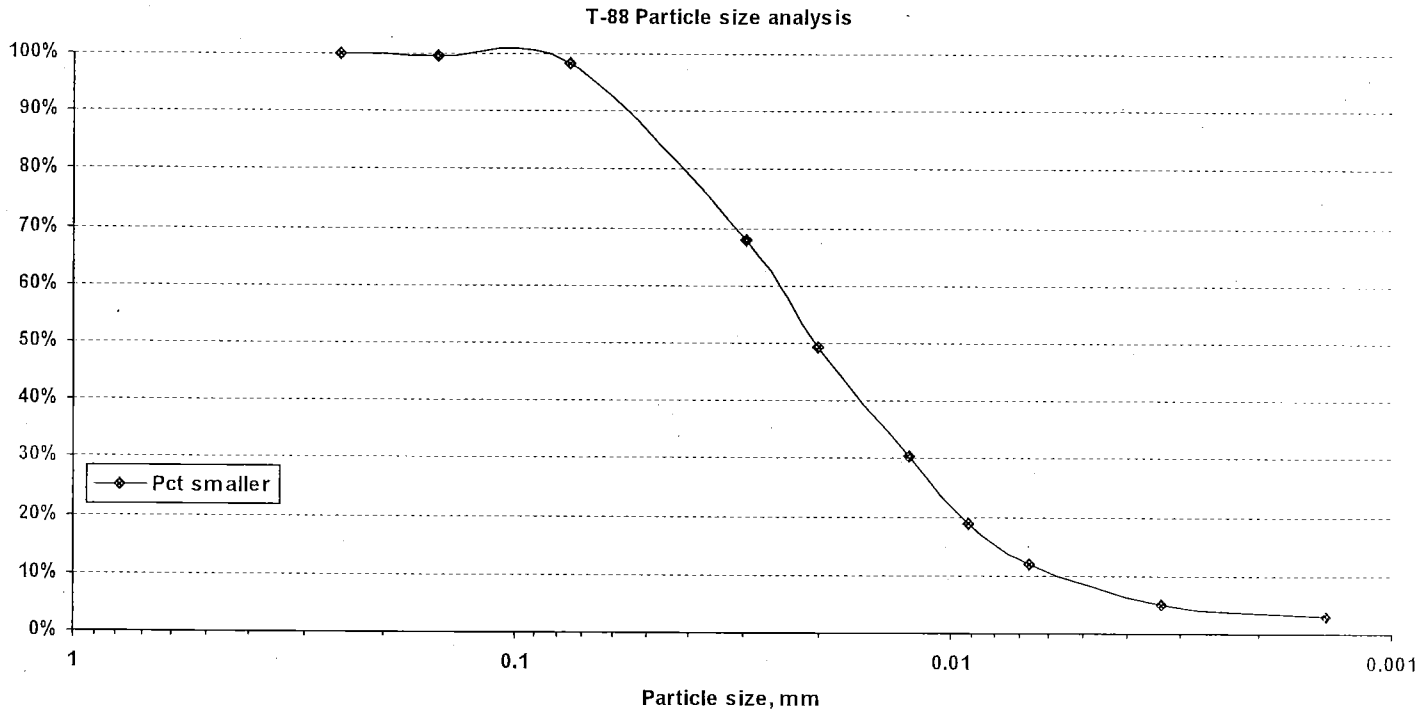
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140347 **Corrected copy:** N/A **Report Date:** 3/14/2014 1:04:55 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 59 FT - 61 FT



Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140353 **Corrected copy:** N/A **Report Date:** 3/14/2014 1:11:09 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/11/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 84 FT **to:** 86 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GSH, AL
Comment: S-24

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	
150 µm (#100):	99.8%
75 µm (#200):	98.8%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	87.4%
0.02 mm:	49.8%
0.005 mm:	7.3%
0.002 mm:	3.3%
0.001 mm:	3.0%

Limits

T-265 Moisture content: 30.9%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity: 2.757

Gr: 0.0% **D2487:** ML
Sa: 1.2% **M145:** A-4 Silt
Si: 98.8%

Comments:

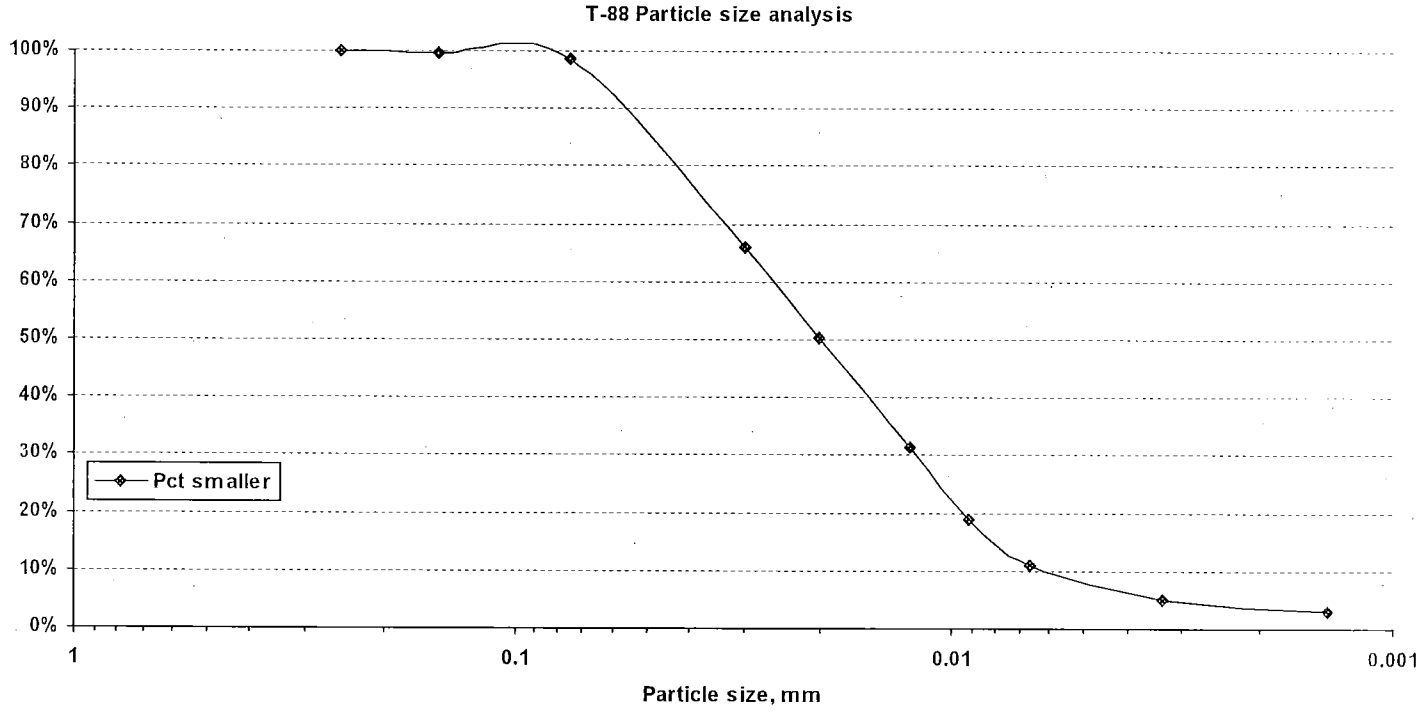
Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140353 **Corrected copy:** N/A **Report Date:** 3/14/2014 1:11:14 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74
Hole: B-1 **Depth:** 84 FT - 86 FT



Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140356 **Corrected copy:** N/A **Report Date:** 3/14/2014 1:19:19 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/11/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 104 FT **to:** 105 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GSH, AL
Comment: S-27

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	100.0%
4.75 mm (#4):	99.8%
2.00 mm (#10):	99.3%
850 µm (#20):	99.1%
425 µm (#40):	98.9%
250 µm (#60):	98.3%
150 µm (#100):	92.2%
75 µm (#200):	68.3%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	56.4%
0.02 mm:	28.4%
0.005 mm:	12.4%
0.002 mm:	6.1%
0.001 mm:	4.9%

Limits

T-265 Moisture content: 25.0%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity: 2.757

Gr: 0.7% **D2487:** ML
Sa: 31.0% **M145:** A-4 Sandy Silt
Si: 68.3%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

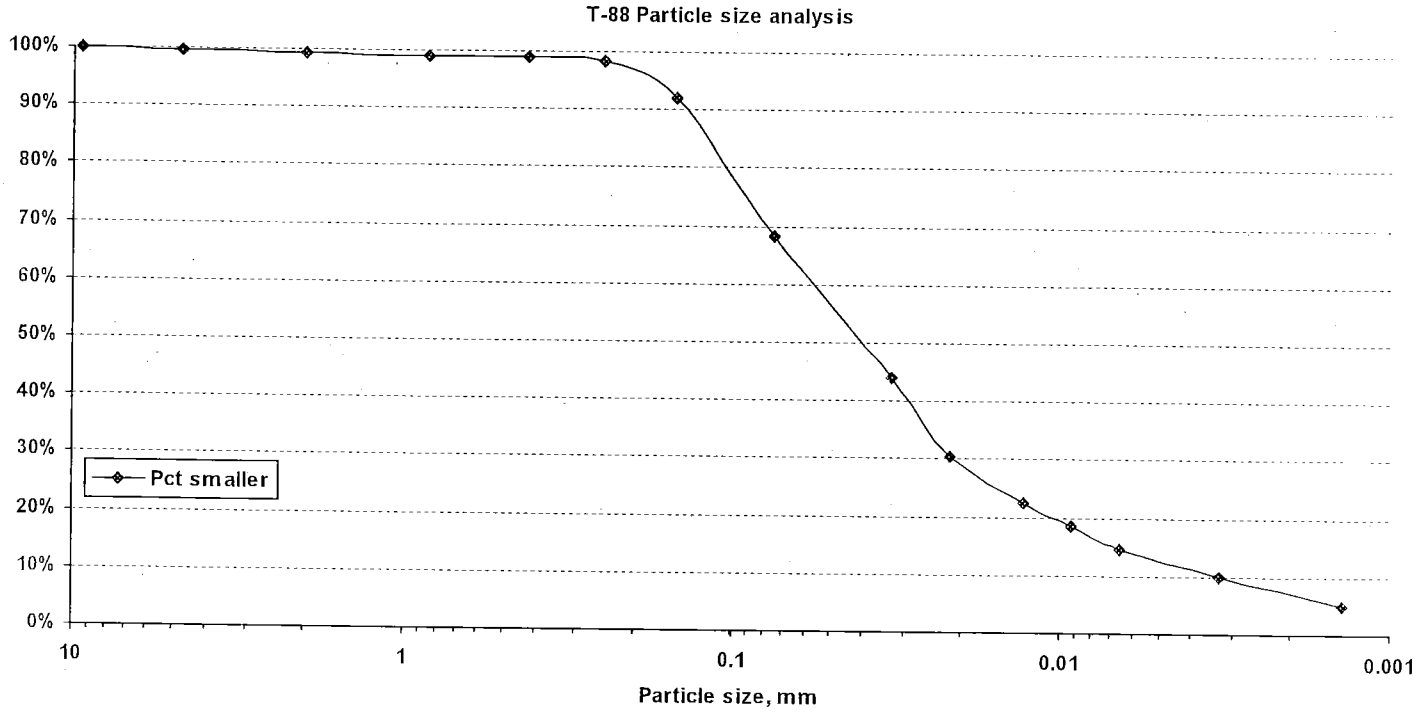
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140356 **Corrected copy:** N/A **Report Date:** 3/14/2014 1:19:28 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 104 FT - 105 FT



Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140329 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:11:16
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 0 FT **to:** 2 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-1

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	95.6%
9.5 mm (3/8"):	89.7%
4.75 mm (#4):	82.0%
2.00 mm (#10):	72.0%
850 µm (#20):	59.2%
425 µm (#40):	46.0%
250 µm (#60):	35.7%
150 µm (#100):	28.0%
75 µm (#200):	18.7%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 14.1%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 28.0% **D2487:** SM
Sa: 53.3% **M145:** A-1-b Gravelly Sand
Si: 18.7%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist

Distribution list

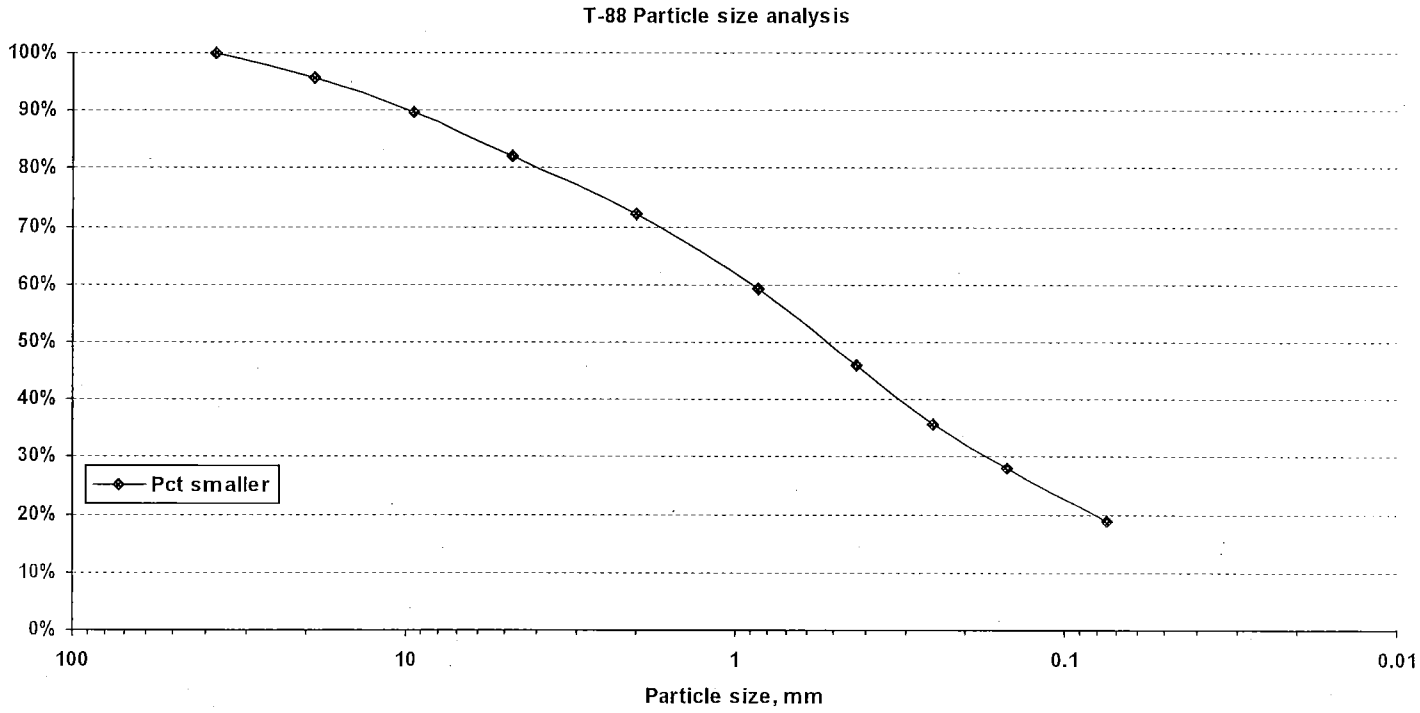
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140329 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:11:22

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 0 FT - 2 FT



Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140331 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:13:10
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 2 FT **to:** 4 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-2

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	95.4%
9.5 mm (3/8"):	91.8%
4.75 mm (#4):	81.1%
2.00 mm (#10):	69.5%
850 µm (#20):	50.4%
425 µm (#40):	34.7%
250 µm (#60):	26.6%
150 µm (#100):	22.3%
75 µm (#200):	16.9%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 8.8%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 30.5% **D2487:** SM
Sa: 52.6% **M145:** A-1-b Gravelly Sand
Si: 16.9%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

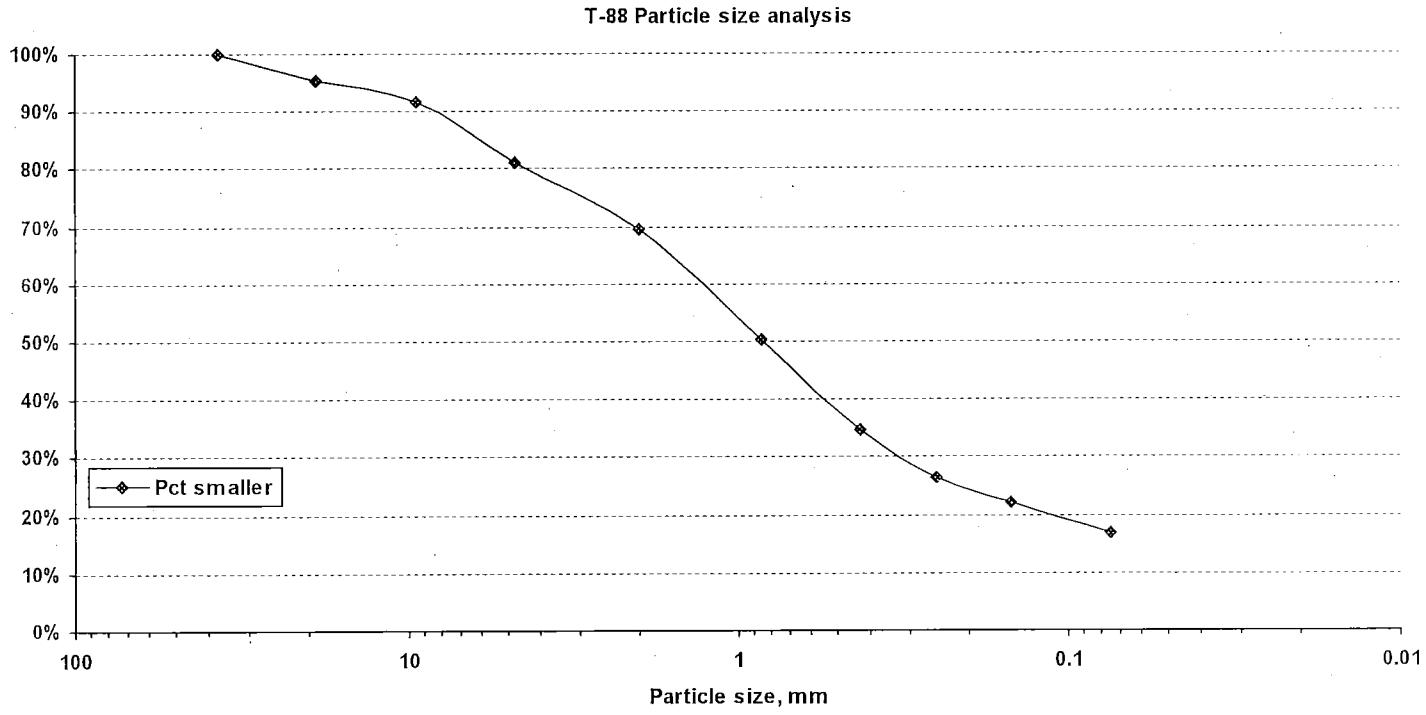
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140331 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:13:16

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 2 FT - 4 FT



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Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140330 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:15:00
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 4 FT **to:** 6 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-3

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	98.2%
4.75 mm (#4):	91.7%
2.00 mm (#10):	85.6%
850 µm (#20):	74.0%
425 µm (#40):	59.8%
250 µm (#60):	47.6%
150 µm (#100):	38.8%
75 µm (#200):	25.4%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 23.3%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 14.4% **D2487:** SM
Sa: 60.2% **M145:** A-2-4 Silty Sand
Si: 25.4%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

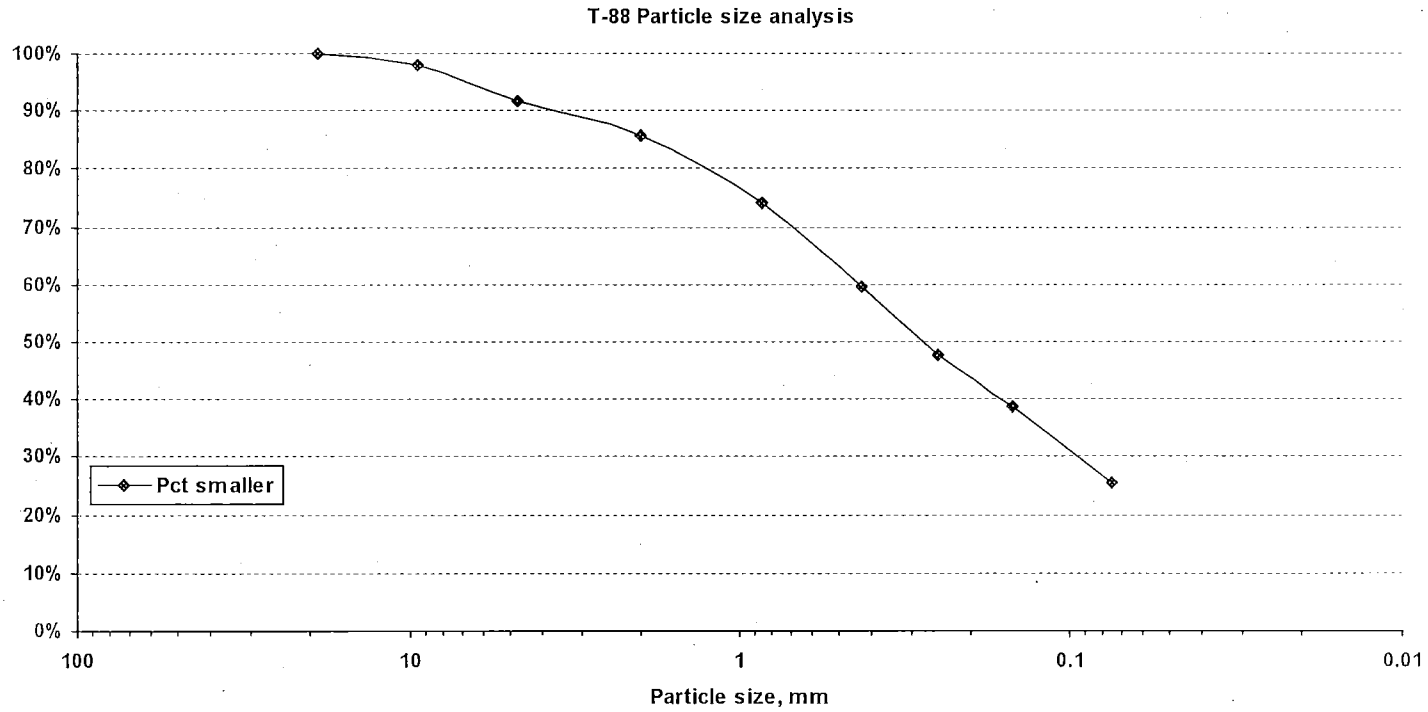
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140330 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:15:05

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 4 FT - 6 FT



Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140332 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:17:02
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 6 FT **to:** 8 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-4

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	98.3%
2.00 mm (#10):	95.0%
850 µm (#20):	86.8%
425 µm (#40):	75.7%
250 µm (#60):	66.1%
150 µm (#100):	57.7%
75 µm (#200):	38.4%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 29.5%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 5.0% **D2487:** SM
Sa: 56.6% **M145:** A-4 Silty Sand
Si: 38.4%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

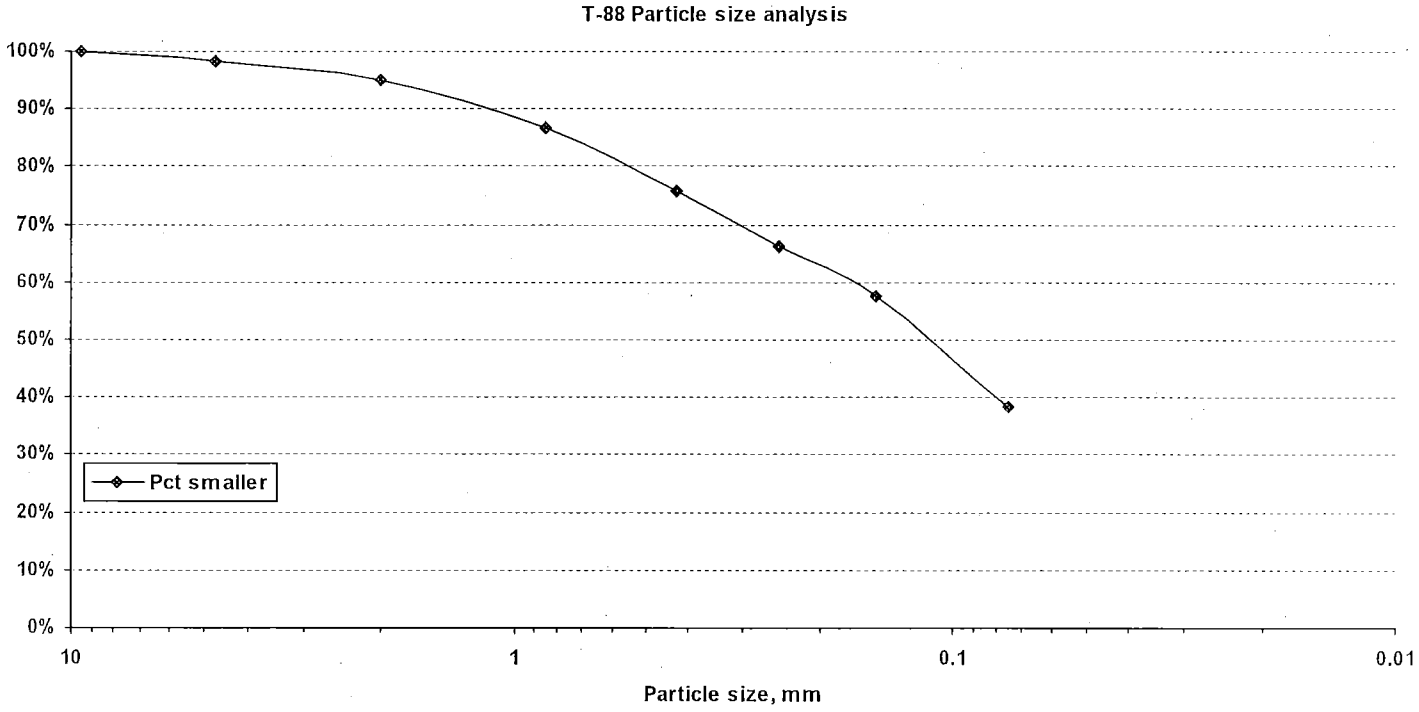
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140332 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:17:06

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 6 FT - 8 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140333 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:19:10
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 8 FT **to:** 10 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-5

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	87.6%
9.5 mm (3/8"):	86.4%
4.75 mm (#4):	82.5%
2.00 mm (#10):	77.9%
850 µm (#20):	74.2%
425 µm (#40):	68.5%
250 µm (#60):	62.2%
150 µm (#100):	55.1%
75 µm (#200):	37.7%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 26.7%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 22.1% **D2487:** SM
Sa: 40.2% **M145:** A-4 Gravelly Silty Sand
Si: 37.7%

Comments: LAB NOTE: BROKEN ROCK WAS WITHIN SAMPLE.

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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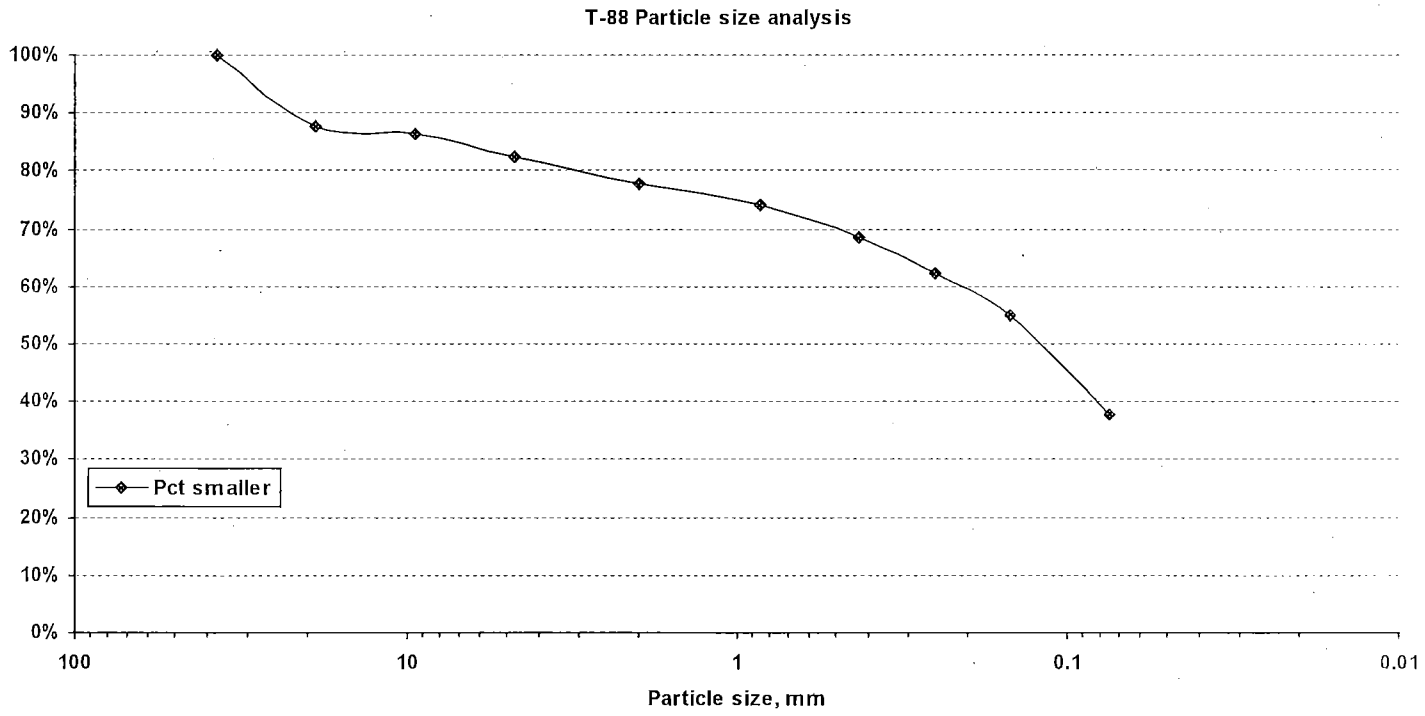
Report on Soil Sample

Lab number: E140333 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:19:14

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 8 FT - 10 FT



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Distribution list
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Report on Soil Sample

Lab number: E140334 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:20:45
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 10 FT **to:** 12 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-6

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	96.0%
4.75 mm (#4):	91.3%
2.00 mm (#10):	84.5%
850 µm (#20):	80.8%
425 µm (#40):	75.7%
250 µm (#60):	70.1%
150 µm (#100):	63.5%
75 µm (#200):	41.0%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 25.0%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 15.5% **D2487:** SM
Sa: 43.5% **M145:** A-4 Silty Sand
Si: 41.0%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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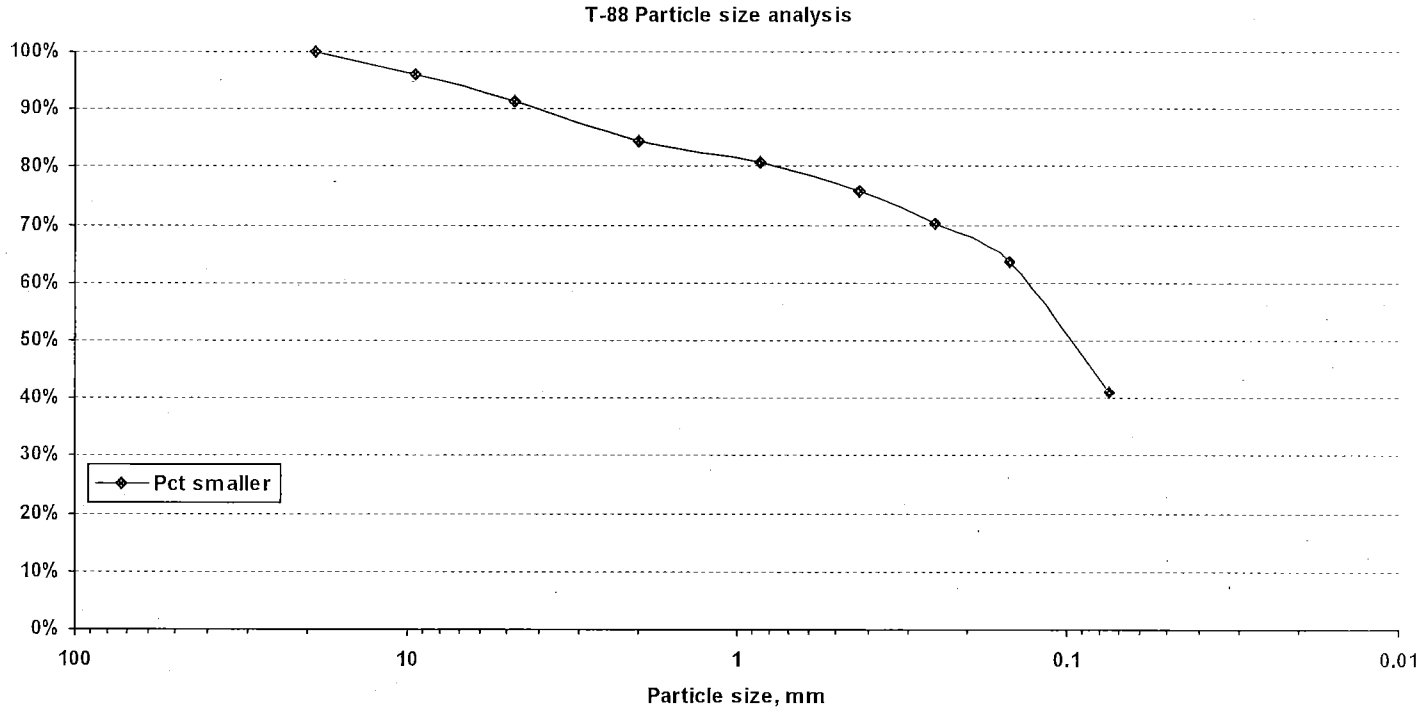
Report on Soil Sample

Lab number: E140334 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:20:51

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 10 FT - 12 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140335 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:23:04
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 12 FT **to:** 14 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-7

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	99.8%
2.00 mm (#10):	96.2%
850 µm (#20):	88.3%
425 µm (#40):	83.8%
250 µm (#60):	79.9%
150 µm (#100):	72.6%
75 µm (#200):	48.3%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 35.3%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 3.8% **D2487:** SM
Sa: 47.9% **M145:** A-4 Sandy Silt
Si: 48.3%

Comments: LAB NOTE: PIECES OF WOOD WERE WITHIN SAMPLE.

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

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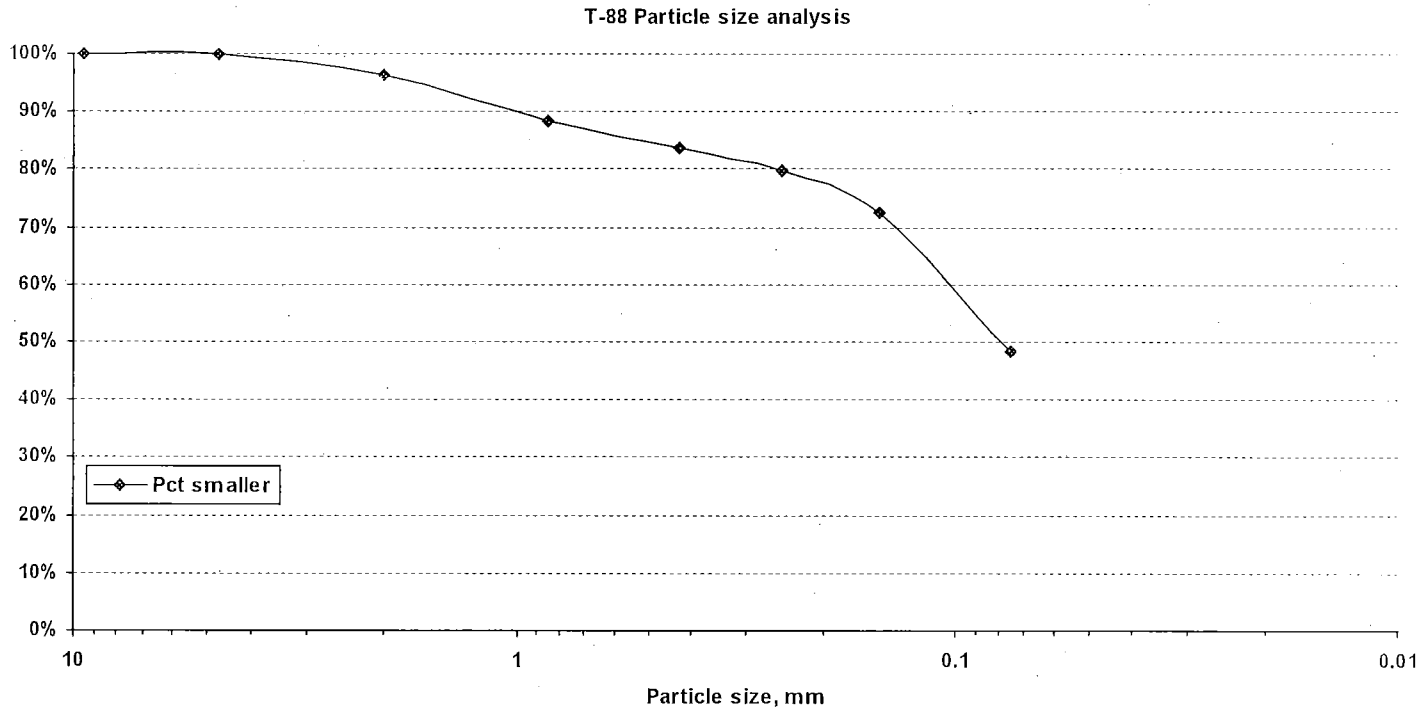
Report on Soil Sample

Lab number: E140335 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:23:07

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 12 FT - 14 FT



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Distribution list
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Report on Soil Sample

Lab number: E140336 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:24:32
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 16 FT **to:** 18 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-9

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	97.7%
2.00 mm (#10):	95.3%
850 µm (#20):	94.1%
425 µm (#40):	93.3%
250 µm (#60):	92.8%
150 µm (#100):	91.9%
75 µm (#200):	83.4%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 30.8%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 4.7% **D2487:** ML
Sa: 12.0% **M145:** A-4 Silt
Si: 83.4%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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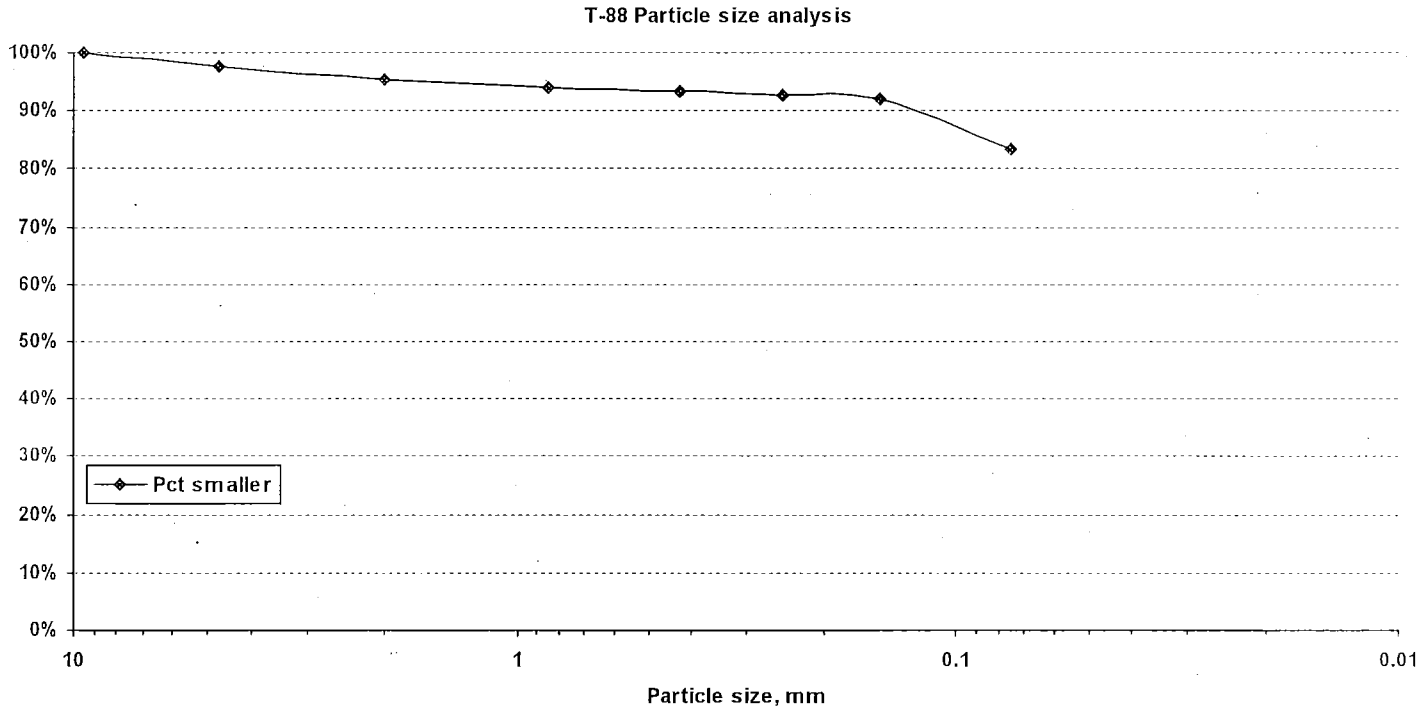
Report on Soil Sample

Lab number: E140336 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:24:37

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 16 FT - 18 FT



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Distribution list
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Report on Soil Sample

Lab number: E140337 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:26:15
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 18 FT **to:** 20 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-10

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	99.7%
850 µm (#20):	99.6%
425 µm (#40):	99.5%
250 µm (#60):	99.4%
150 µm (#100):	99.2%
75 µm (#200):	98.1%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 36.1%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.3% **D2487:** ML
Sa: 1.7% **M145:** A-4 Silt
Si: 98.1%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

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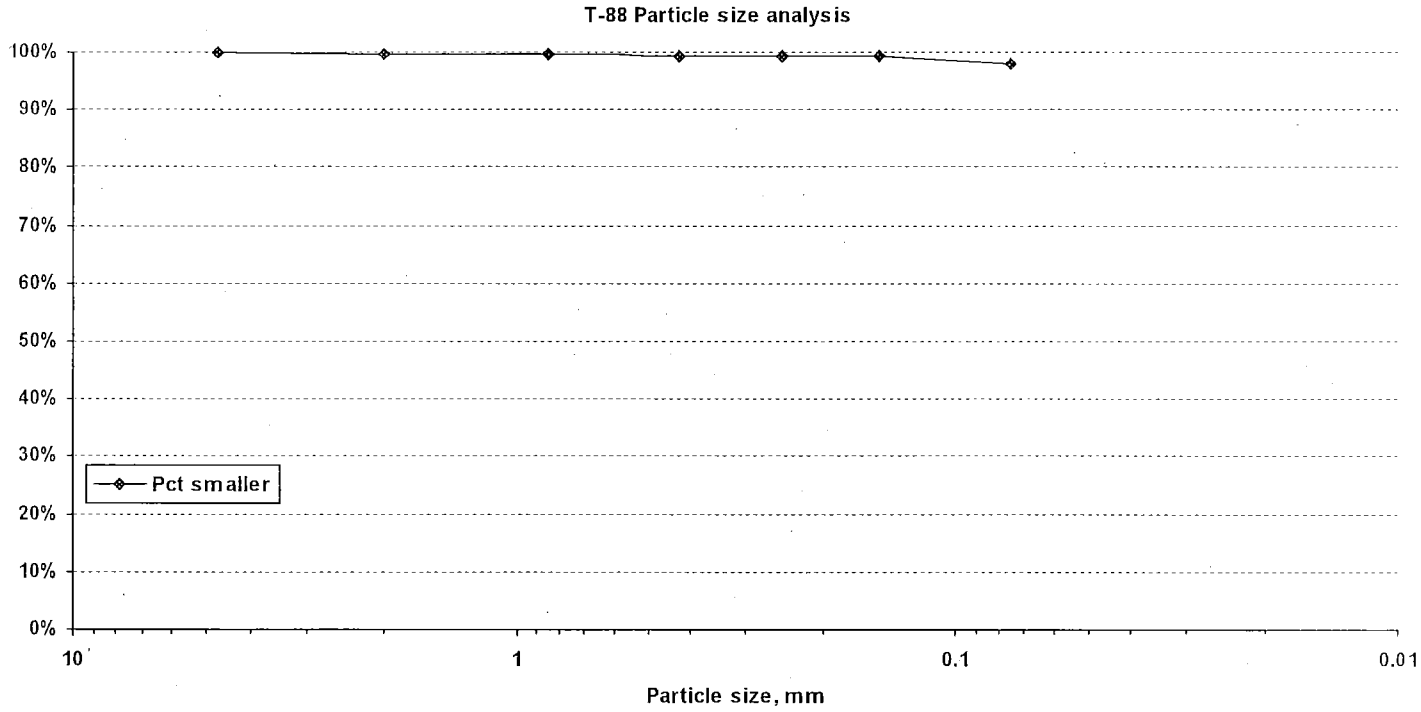
Report on Soil Sample

Lab number: E140337 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:26:20

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 18 FT - 20 FT



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Distribution list
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Report on Soil Sample

Lab number: E140338 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:28:39
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 20 FT **to:** 22 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-11

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	98.9%
2.00 mm (#10):	98.8%
850 µm (#20):	98.8%
425 µm (#40):	98.8%
250 µm (#60):	98.6%
150 µm (#100):	98.5%
75 µm (#200):	93.4%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 28.5%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 1.2% **D2487:** ML
Sa: 5.3% **M145:** A-4 Silt
Si: 93.4%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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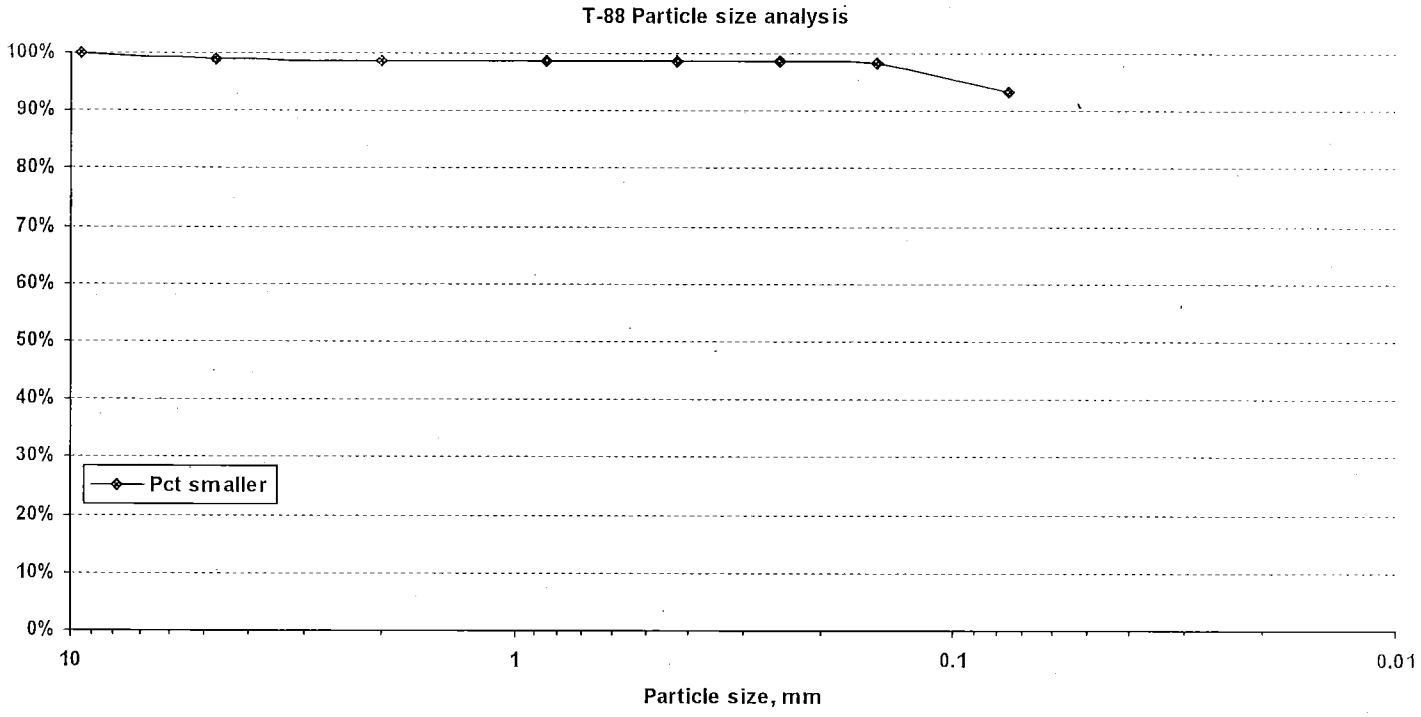
Report on Soil Sample

Lab number: E140338 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:28:45

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 20 FT - 22 FT



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Distribution list
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Report on Soil Sample

Lab number: E140339 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:36:06
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 22 FT **to:** 24 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-12

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	99.0%
2.00 mm (#10):	98.9%
850 µm (#20):	98.9%
425 µm (#40):	98.9%
250 µm (#60):	98.8%
150 µm (#100):	98.7%
75 µm (#200):	93.3%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 31.8%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 1.1% **D2487:** ML
Sa: 5.6% **M145:** A-4 Silt
Si: 93.3%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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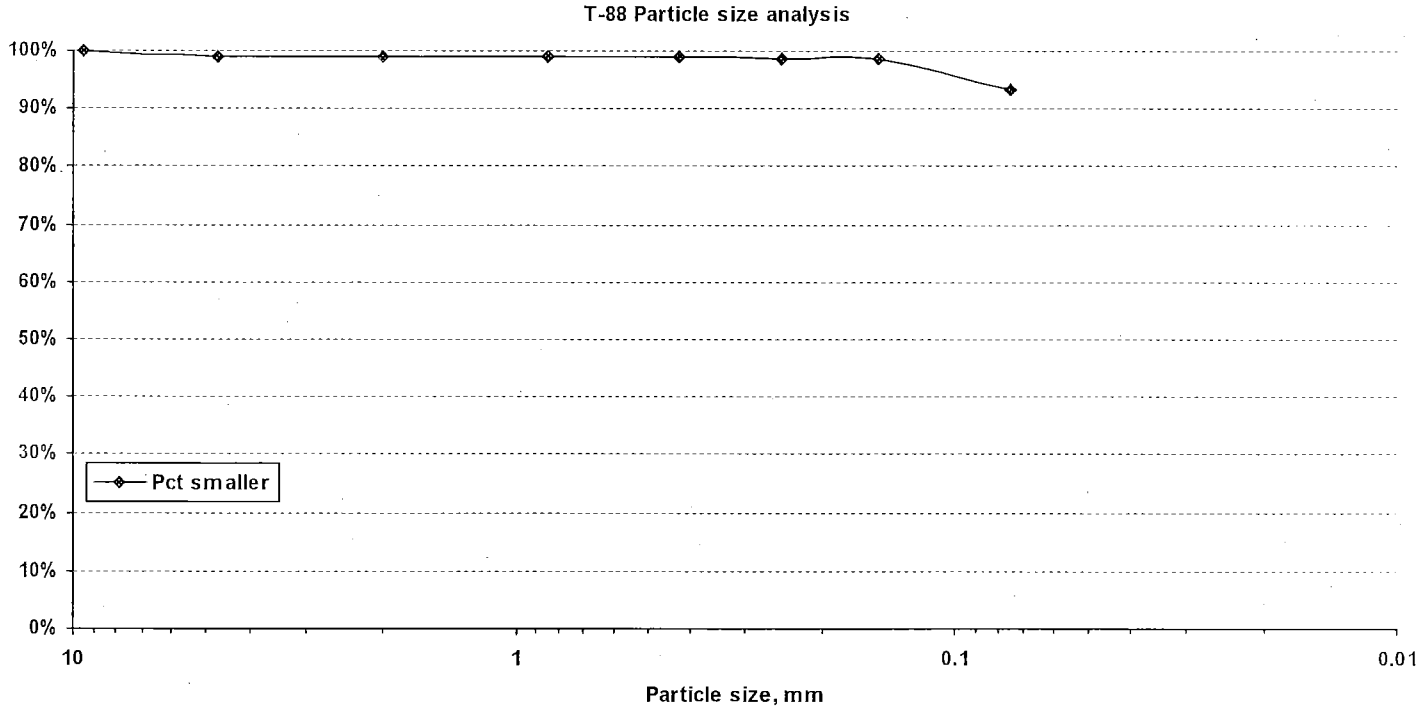
Report on Soil Sample

Lab number: E140339 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:36:09

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 22 FT - 24 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140340 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:38:26
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 24 FT **to:** 26 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-13

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	
150 µm (#100):	99.7%
75 µm (#200):	98.3%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 29.8%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 1.7% **M145:** A-4 Silt
Si: 98.3%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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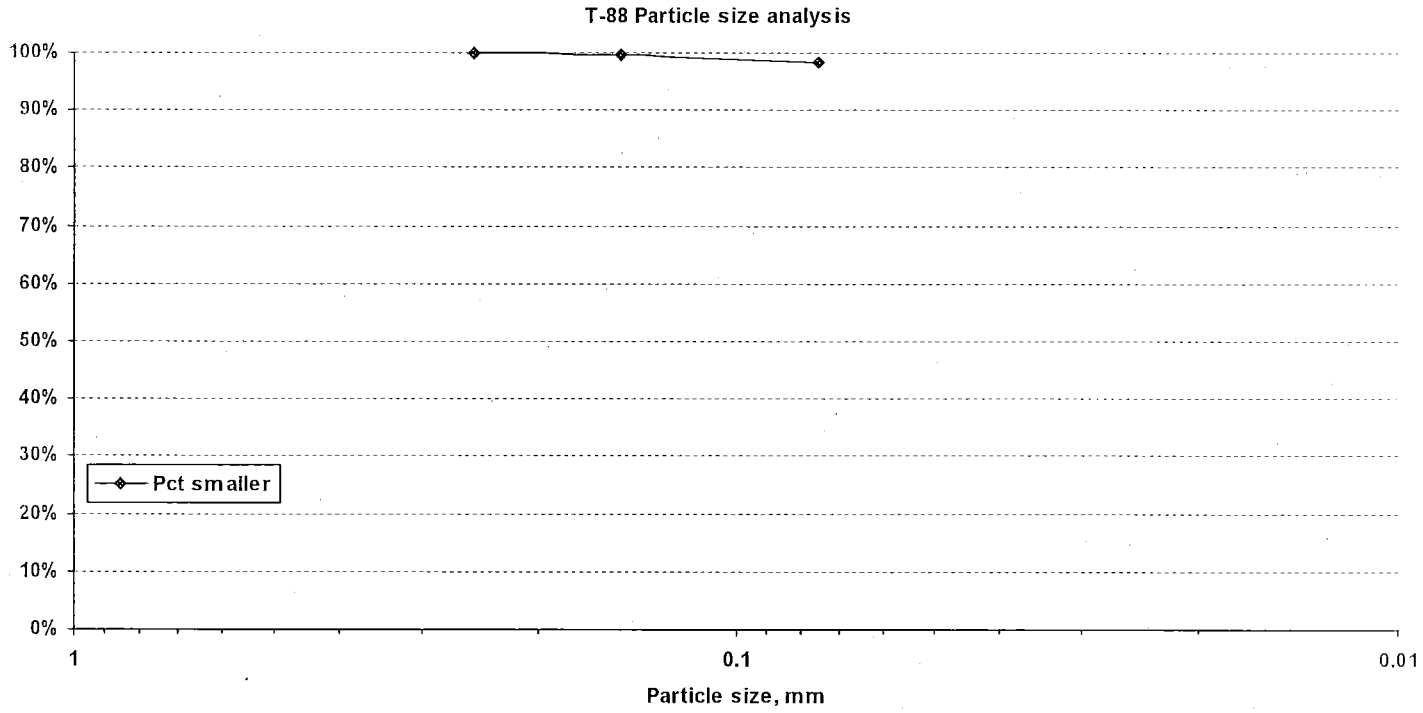
Report on Soil Sample

Lab number: E140340 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:38:30

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 24 FT - 26 FT



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Distribution list
TERRACON
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J. TOUCHETTE

Report on Soil Sample

Lab number: E140341 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:39:49
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 29 FT **to:** 31 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-14

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	
150 µm (#100):	99.9%
75 µm (#200):	99.0%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 34.1%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 1.0% **M145:** A-4 Silt
Si: 99.0%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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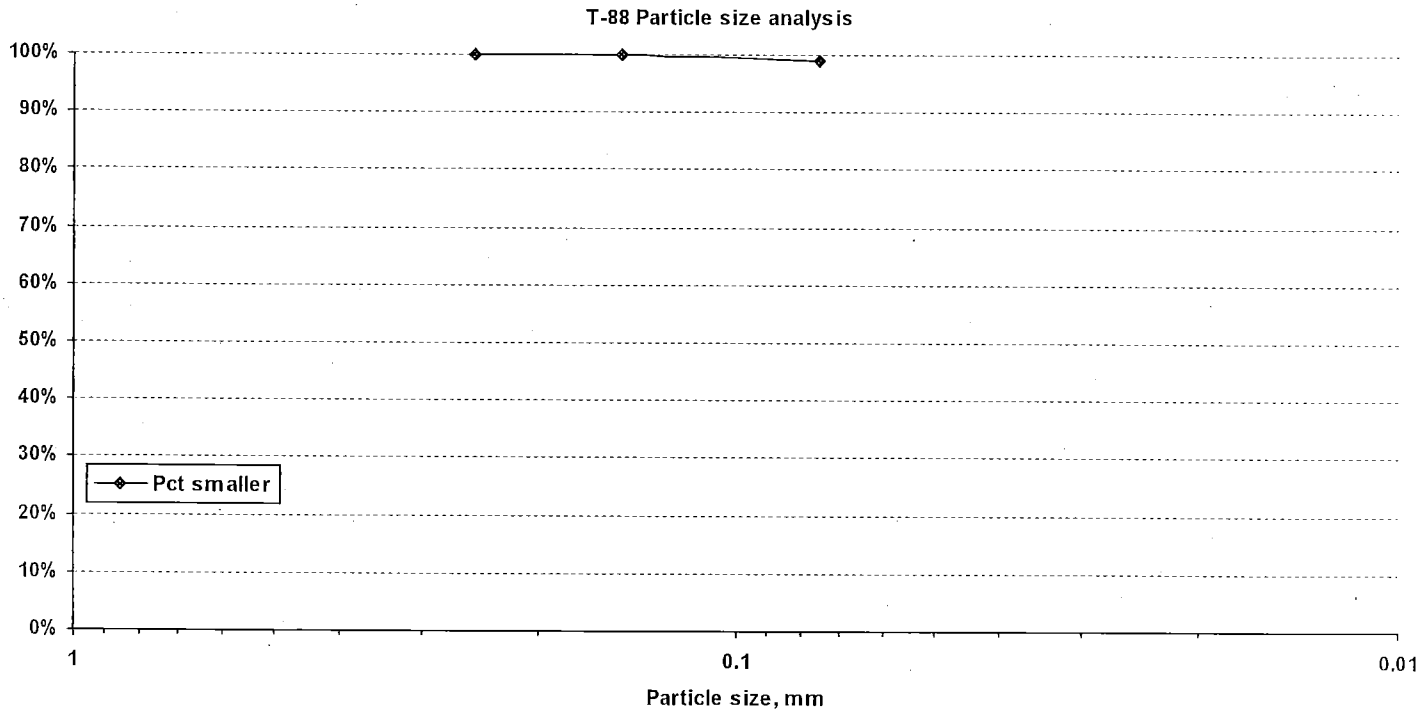
Report on Soil Sample

Lab number: E140341 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:40:05

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 29 FT - 31 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140342 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:47:35
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 34 FT **to:** 36 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-15

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	
150 µm (#100):	
75 µm (#200):	99.3%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 34.6%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 0.7% **M145:** A-4 Silt
Si: 99.3%

Comments: LAB NOTE: A VERY SMALL LAYER OF CLAY WAS NOTICEABLE.

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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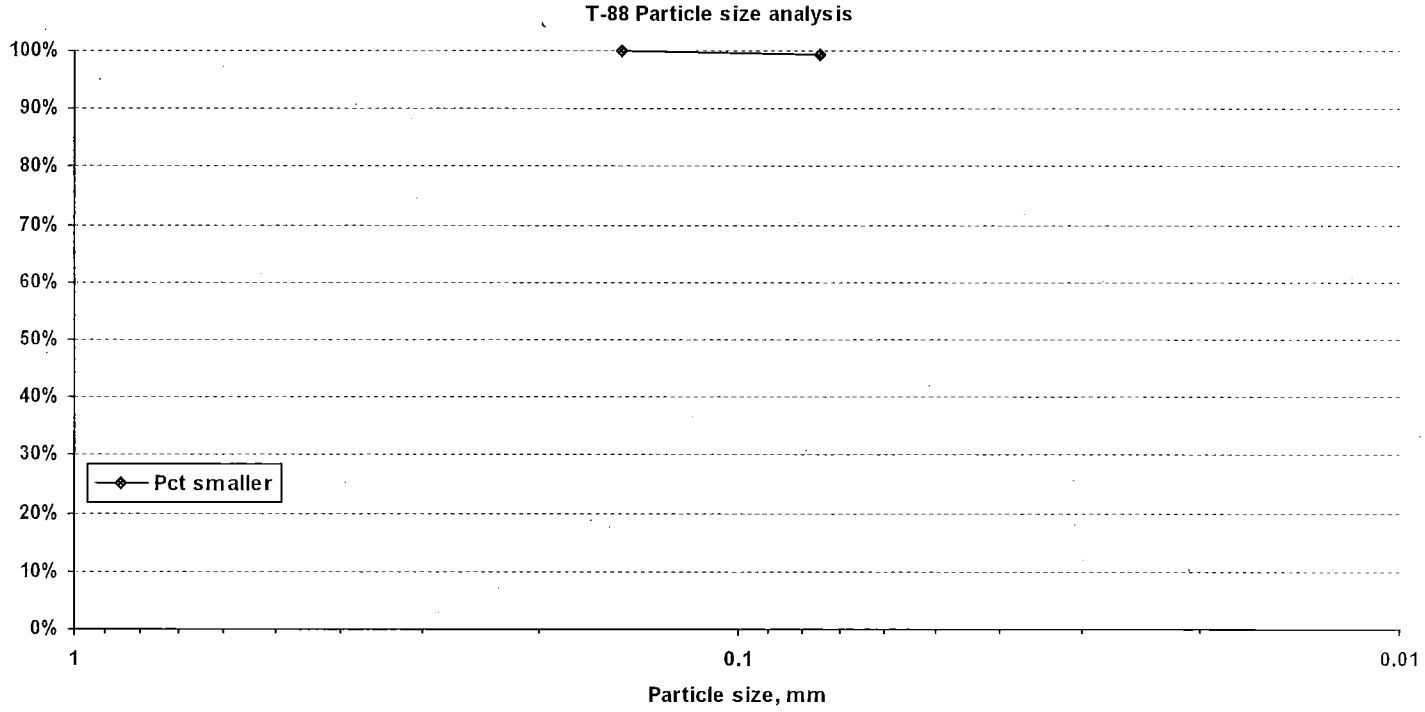
Report on Soil Sample

Lab number: E140342 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:47:50

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 34 FT - 36 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140343 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:49:25
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 39 FT **to:** 41 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-16

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	
150 µm (#100):	
75 µm (#200):	99.2%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 31.7%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 0.8% **M145:** A-4 Silt
Si: 99.2%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist

Distribution list

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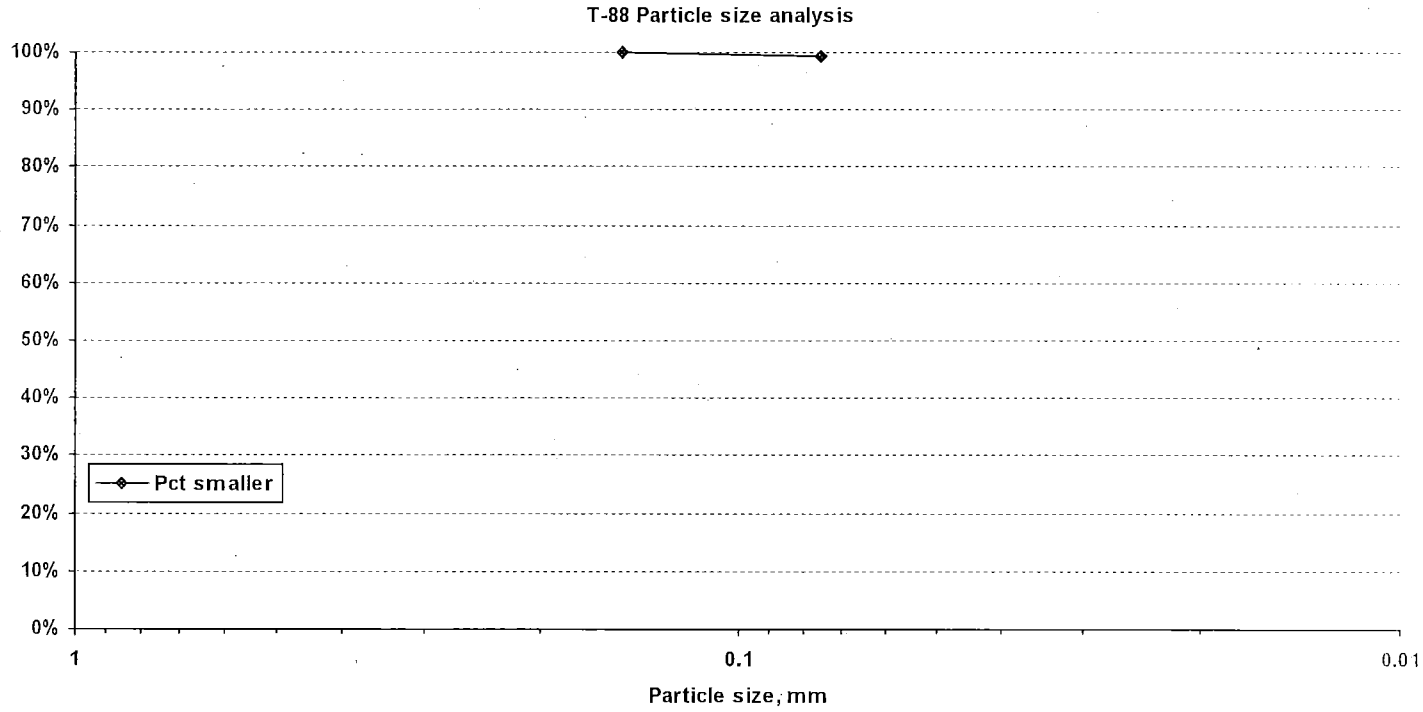
Report on Soil Sample

Lab number: E140343 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:49:28

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 39 FT - 41 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140345 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:50:54
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 51 FT **to:** 53 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-18

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	
150 µm (#100):	99.9%
75 µm (#200):	99.0%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 34.3%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 1.0% **M145:** A-4 Silt
Si: 99.0%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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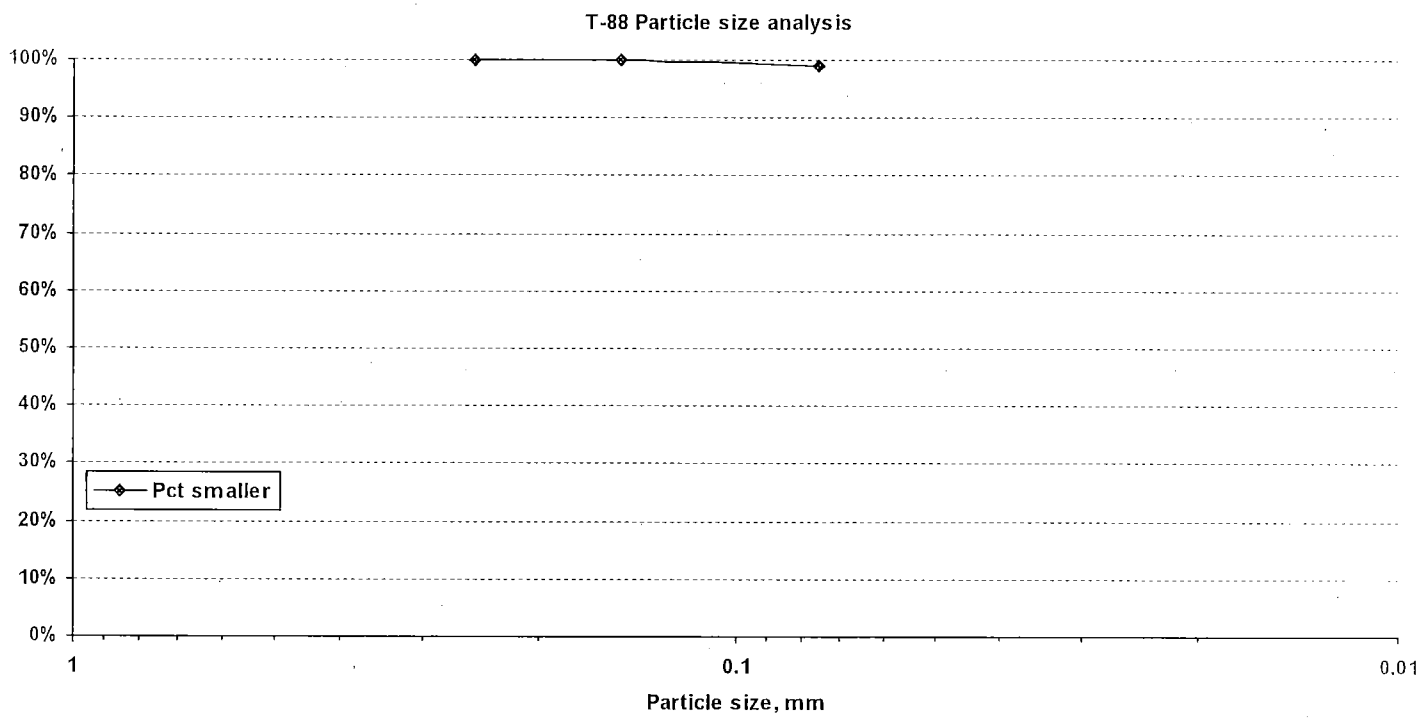
Report on Soil Sample

Lab number: E140345 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:50:58

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 51 FT - 53 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140346 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:52:30
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/10/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 54 FT **to:** 56 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-19

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	99.9%
150 µm (#100):	99.6%
75 µm (#200):	93.9%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 30.8%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 6.1% **M145:** A-4 Silt
Si: 93.9%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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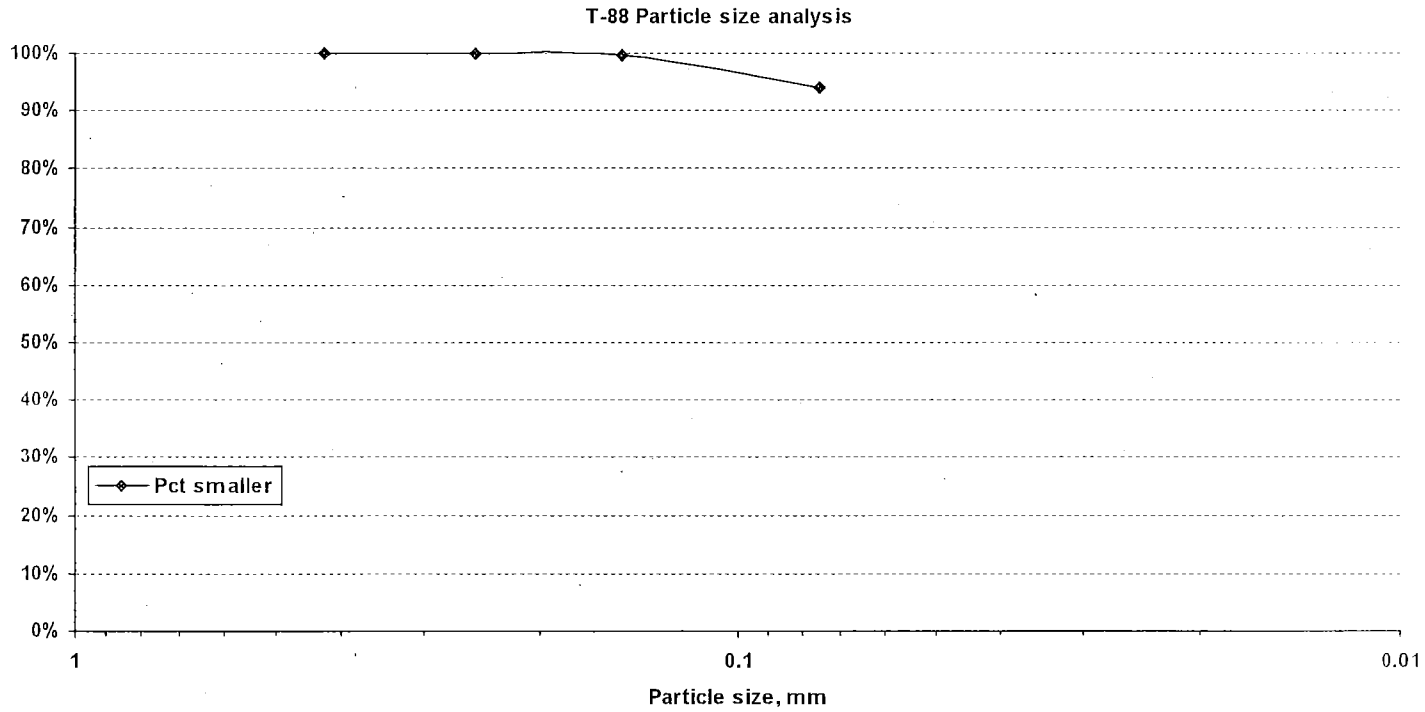
Report on Soil Sample

Lab number: E140346 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:52:33

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 54 FT - 56 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140351 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:55:26
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/11/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 65 FT **to:** 67 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-21

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	99.7%
150 µm (#100):	99.4%
75 µm (#200):	99.0%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 34.4%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 1.0% **M145:** A-4 Silt
Si: 99.0%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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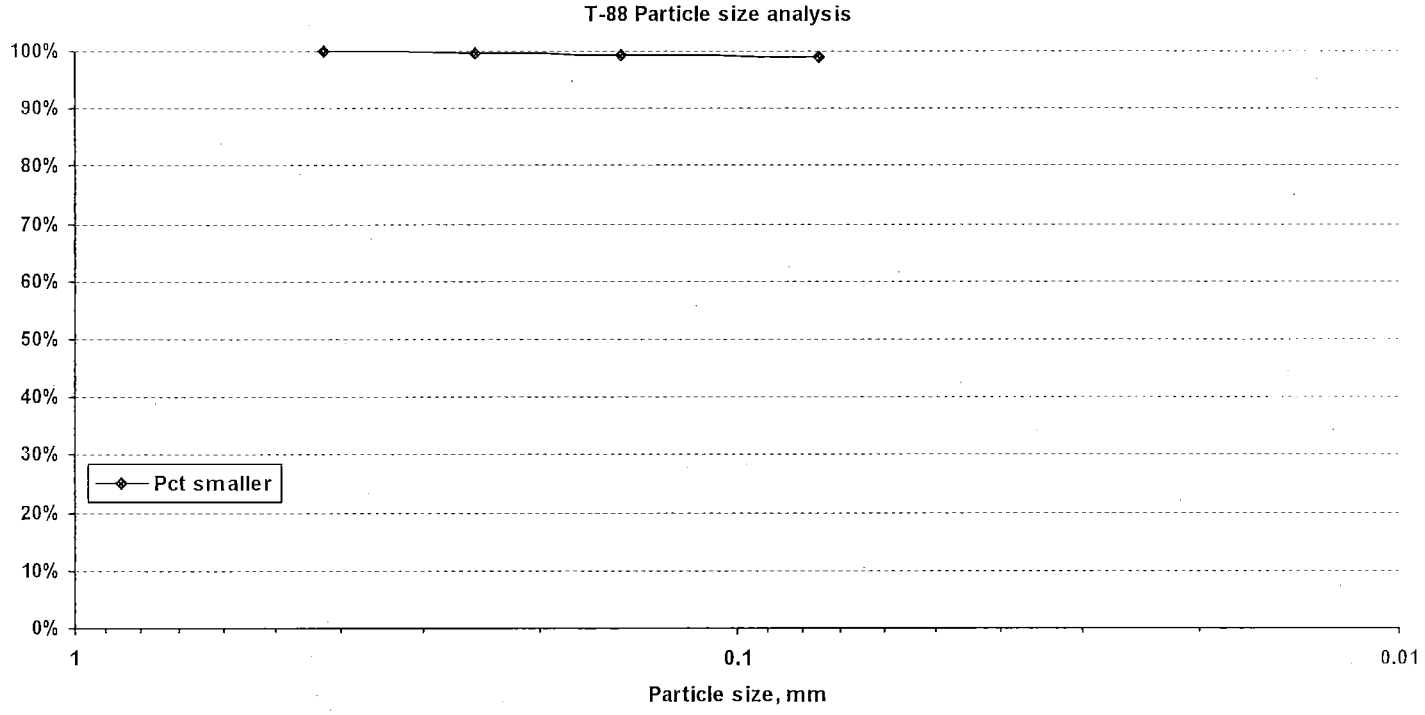
Report on Soil Sample

Lab number: E140351 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:55:30

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 65 FT - 67 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140352 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:56:55
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/11/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 69 FT **to:** 71 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-22

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	
150 µm (#100):	99.9%
75 µm (#200):	99.8%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 34.9%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 0.2% **M145:** A-4 Silt
Si: 99.8%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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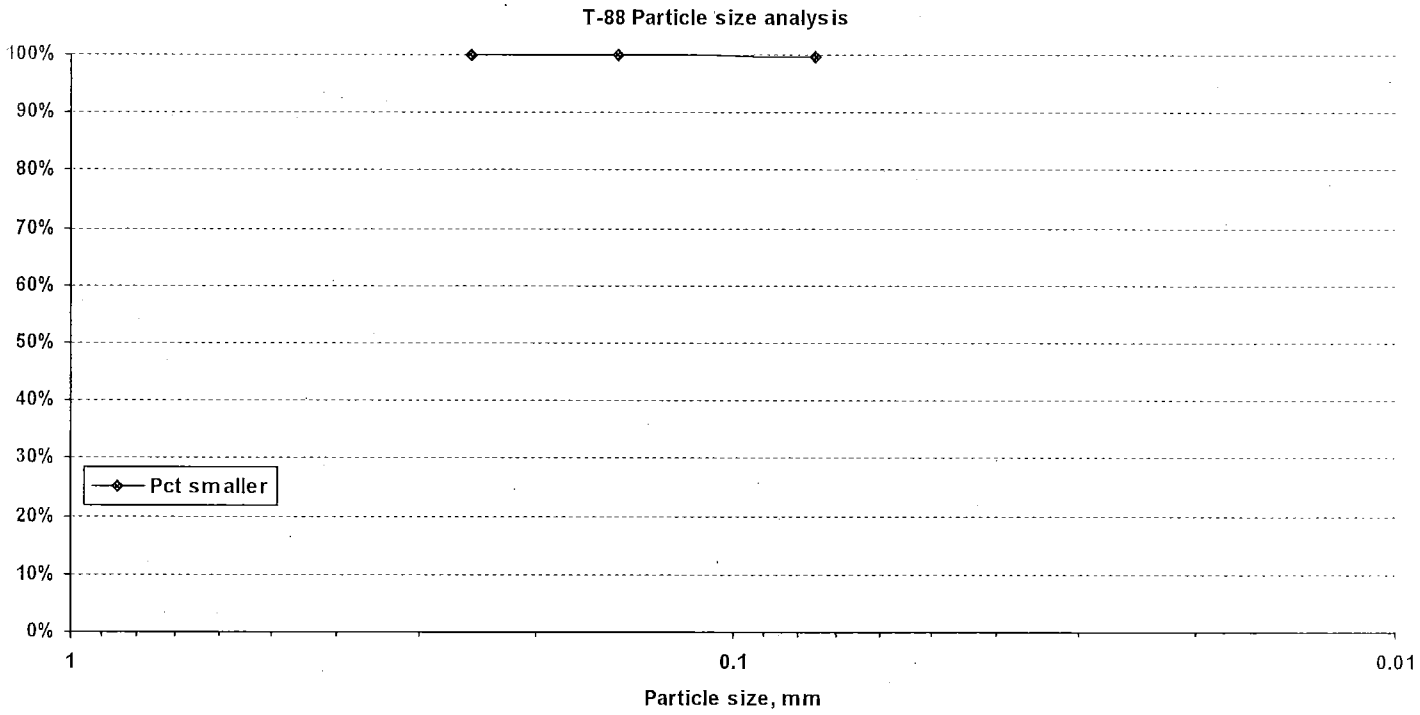
Report on Soil Sample

Lab number: E140352 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:56:59

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 69 FT - 71 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140354 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:58:30
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/11/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 94 FT **to:** 96 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-25

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	99.9%
250 µm (#60):	99.4%
150 µm (#100):	98.5%
75 µm (#200):	96.9%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 33.5%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 3.1% **M145:** A-4 Silt
Si: 96.9%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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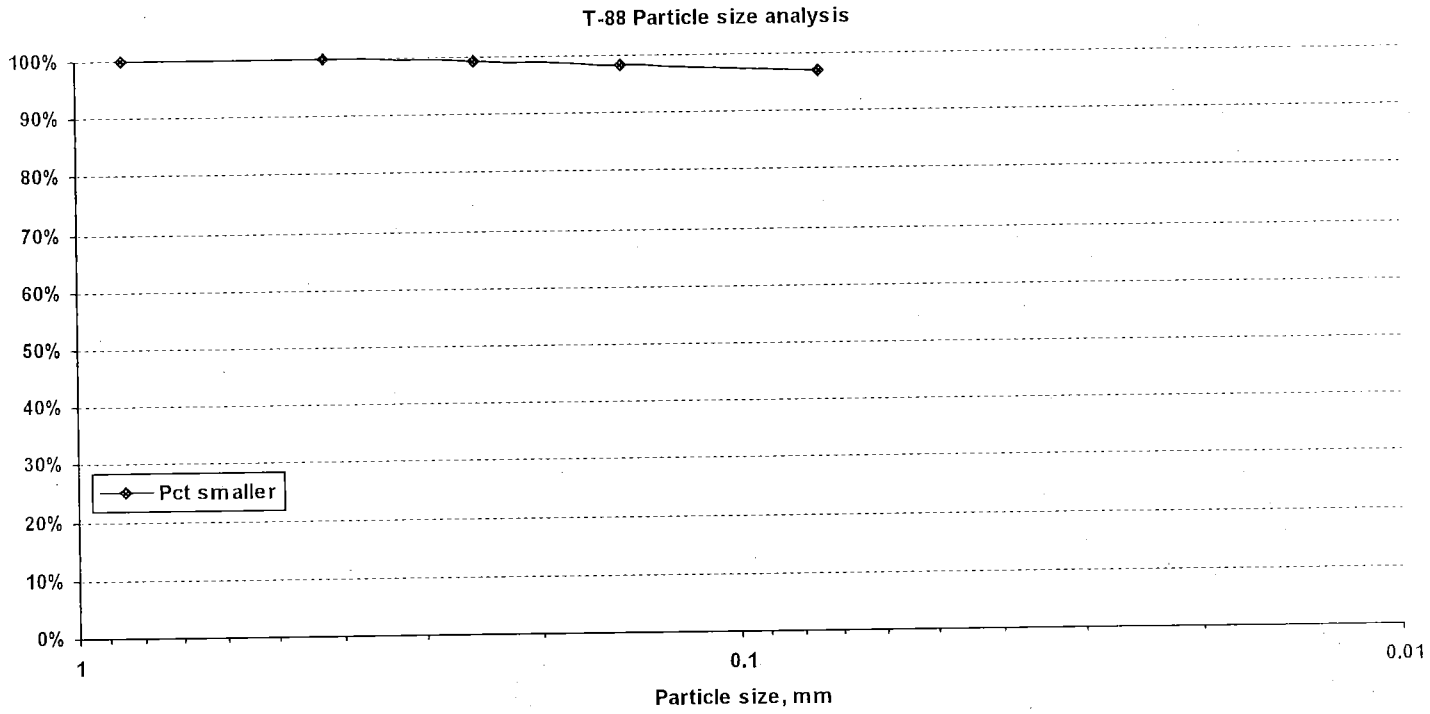
Report on Soil Sample

Lab number: E140354 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:58:33

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 94 FT - 96 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140355 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:59:52
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/11/2014 **Received:** 3/11/2014 **Tested:** 3/11/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-1 **Depth:** 99 FT **to:** 101 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-26

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	99.9%
150 µm (#100):	99.7%
75 µm (#200):	92.2%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 28.1%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 7.8% **M145:** A-4 Silt
Si: 92.2%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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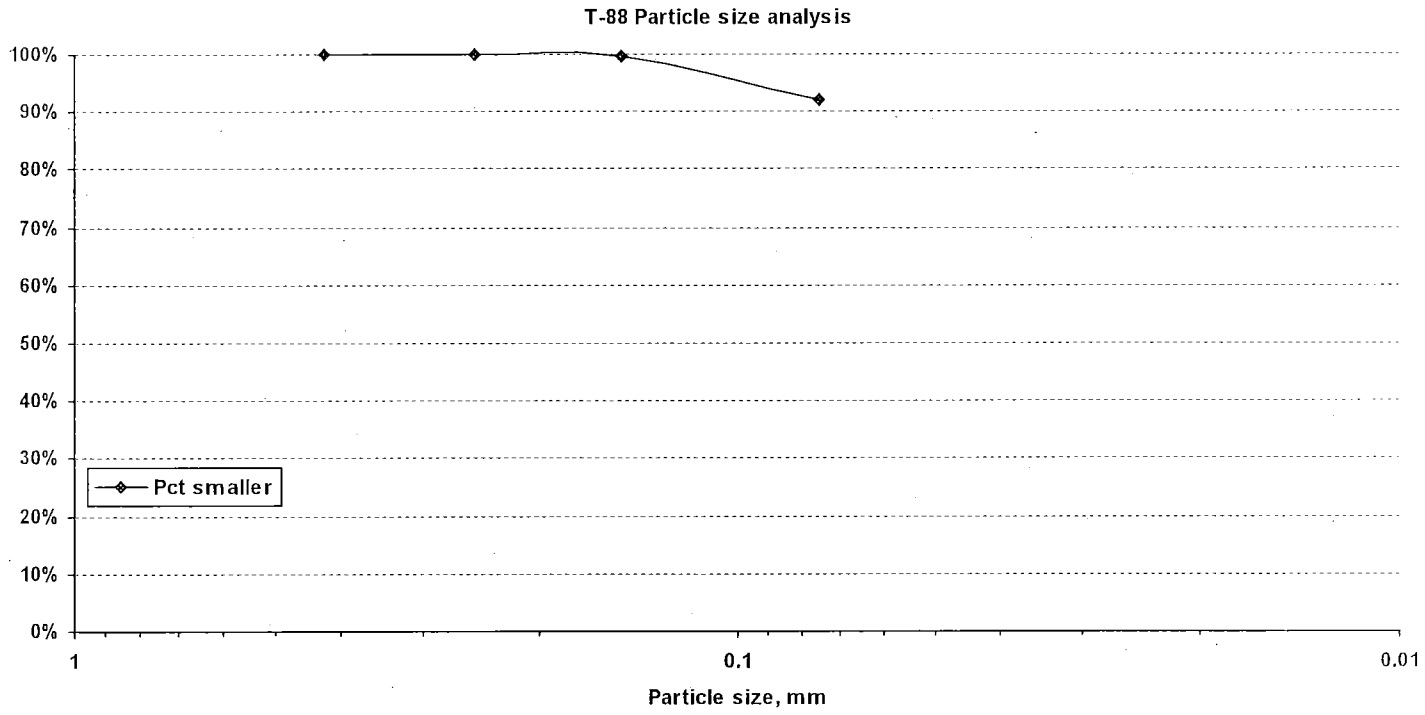
Report on Soil Sample

Lab number: E140355 **Corrected copy:** N/A **Report Date:** 3/13/2014 11:59:55

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-1 **Depth:** 99 FT - 101 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140379 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:04:16 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 4 FT **to:** 6 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-1

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	93.2%
2.00 mm (#10):	85.3%
850 µm (#20):	72.2%
425 µm (#40):	59.5%
250 µm (#60):	50.7%
150 µm (#100):	44.1%
75 µm (#200):	32.5%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 17.3%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 14.7% **D2487:** SM
Sa: 52.8% **M145:** A-2-4 Silty Sand
Si: 32.5%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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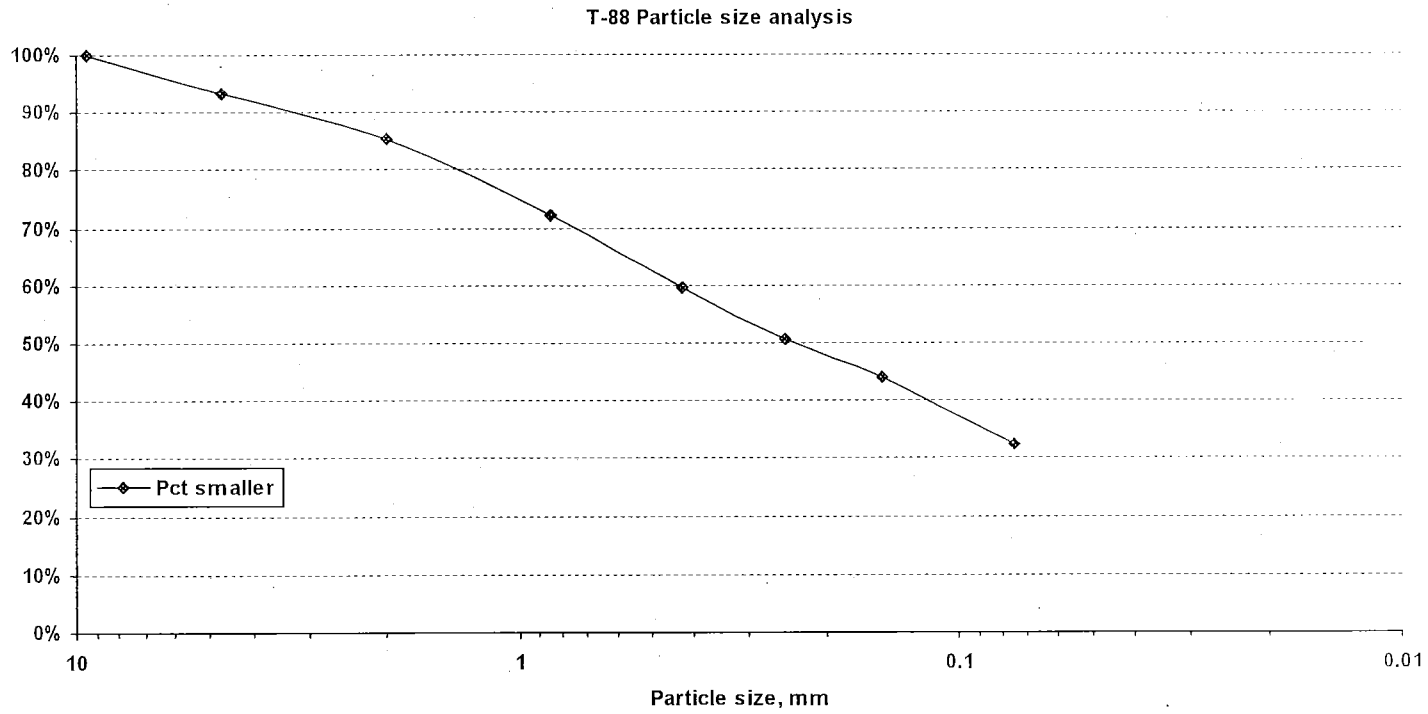
Report on Soil Sample

Lab number: E140379 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:04:22 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 4 FT - 6 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140380 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:05:40 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 9 FT **to:** 11 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-2

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	99.3%
850 µm (#20):	98.9%
425 µm (#40):	98.2%
250 µm (#60):	96.5%
150 µm (#100):	93.1%
75 µm (#200):	77.3%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 25.4%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.7% **D2487:** ML
Sa: 22.1% **M145:** A-4 Sandy Silt
Si: 77.3%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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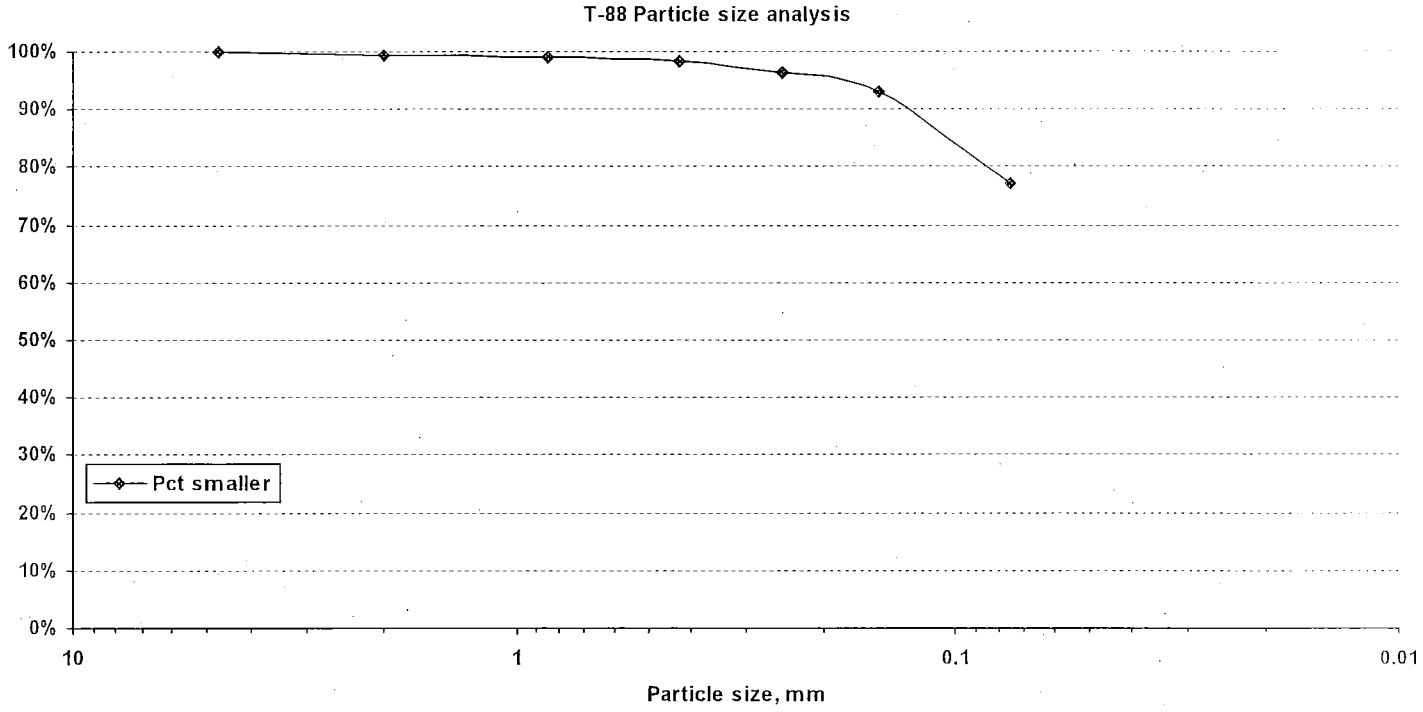
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140380 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:05:46 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 9 FT - 11 FT



Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140381 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:07:49 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 19 FT **to:** 21 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-4

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	99.4%
4.75 mm (#4):	96.9%
2.00 mm (#10):	96.9%
850 µm (#20):	96.9%
425 µm (#40):	96.7%
250 µm (#60):	96.6%
150 µm (#100):	96.4%
75 µm (#200):	95.8%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 36.7%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 3.1% **D2487:** ML
Sa: 1.1% **M145:** A-4 Silt
Si: 95.8%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

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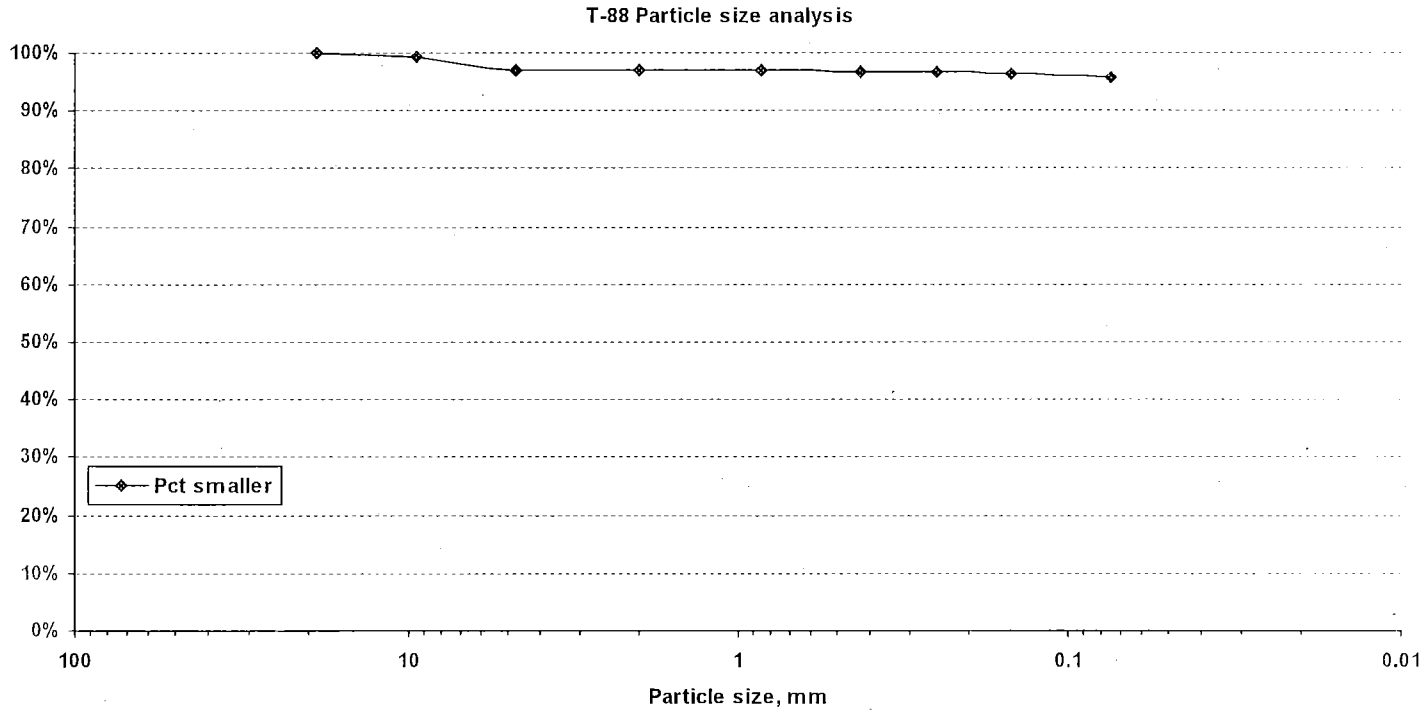
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140381 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:07:53 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 19 FT - 21 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140382 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:09:22 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 29 FT **to:** 31 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-6

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	96.5%
2.00 mm (#10):	96.4%
850 µm (#20):	96.3%
425 µm (#40):	95.8%
250 µm (#60):	95.5%
150 µm (#100):	94.3%
75 µm (#200):	93.0%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 35.8%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 3.6% **D2487:** ML
Sa: 3.4% **M145:** A-4 Silt
Si: 93.0%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

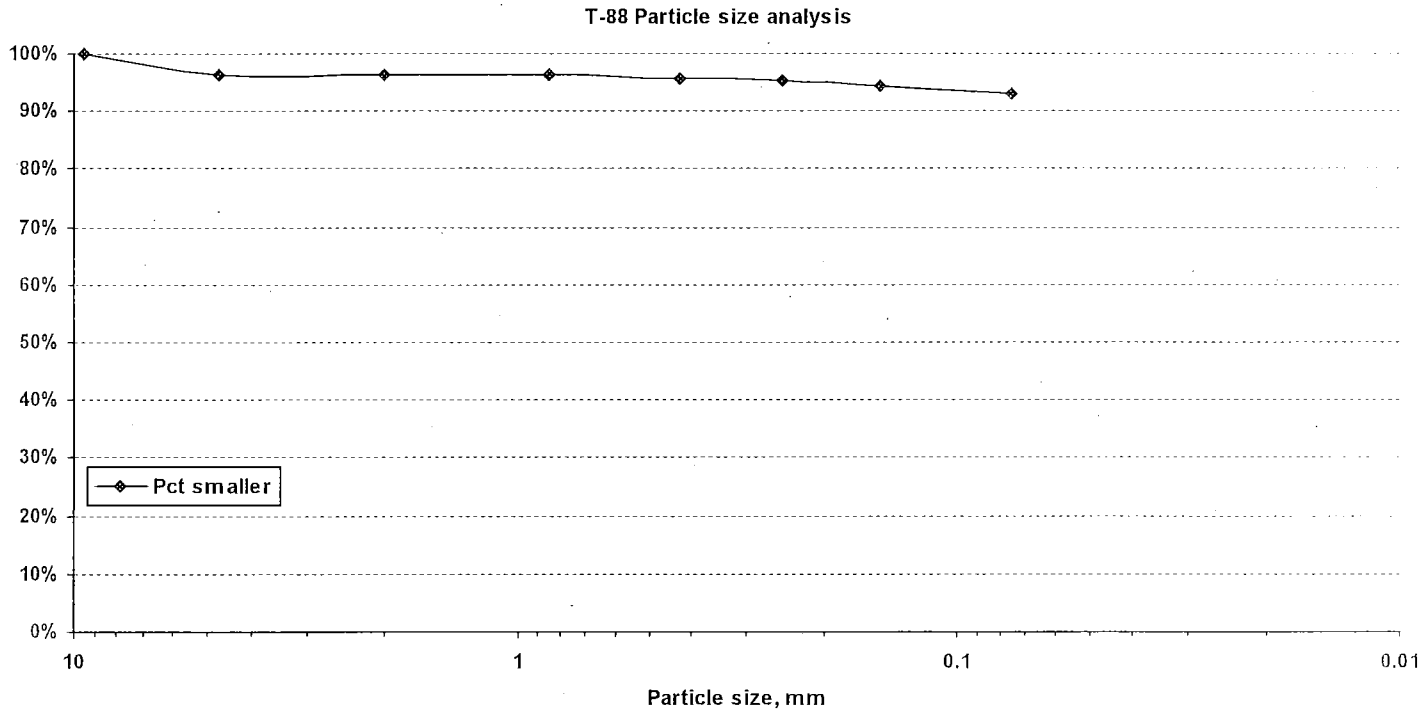
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140382 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:09:25 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 29 FT - 31 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140383 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:11:12 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 34 FT **to:** 36 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-7

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	99.9%
425 µm (#40):	99.6%
250 µm (#60):	99.2%
150 µm (#100):	99.1%
75 µm (#200):	96.8%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 35.5%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 3.2% **M145:** A-4 Silt
Si: 96.8%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

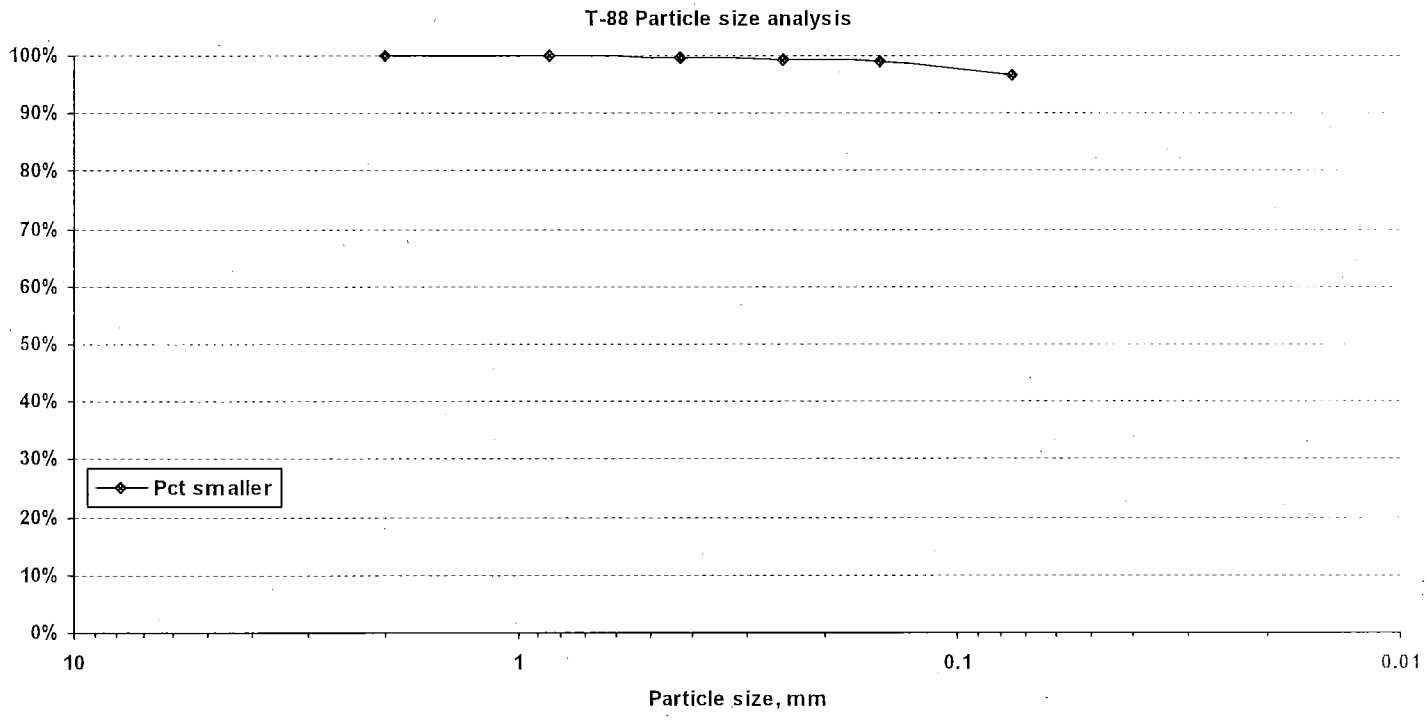
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140383 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:11:15 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 34 FT - 36 FT



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1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140384 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:12:46 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 39 FT **to:** 41 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-8

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	99.8%
850 µm (#20):	99.6%
425 µm (#40):	99.4%
250 µm (#60):	99.0%
150 µm (#100):	98.0%
75 µm (#200):	95.4%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 26.5%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.2% **D2487:** ML
Sa: 4.4% **M145:** A-4 Silt
Si: 95.4%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

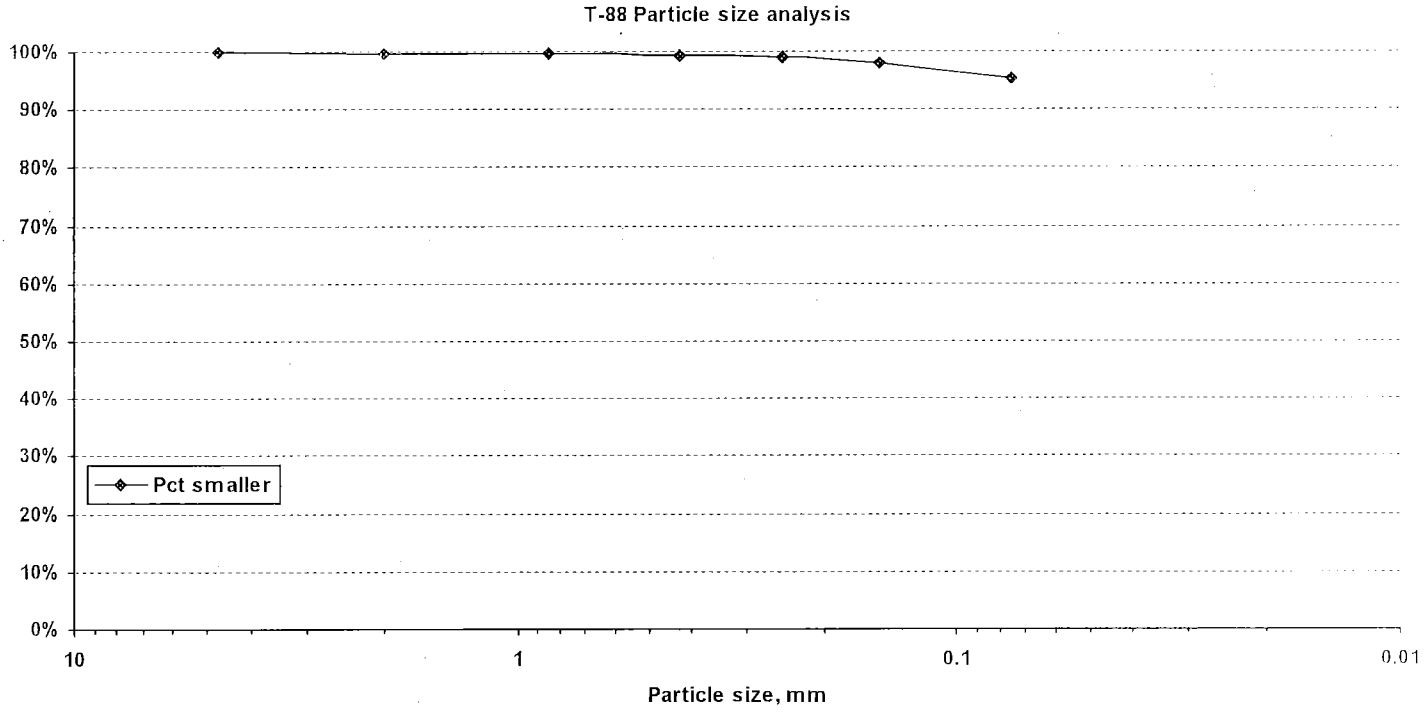
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140384 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:12:50 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 39 FT - 41 FT



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Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140385 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:14:19 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 44 FT **to:** 46 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-9

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	
425 µm (#40):	
250 µm (#60):	99.9%
150 µm (#100):	99.6%
75 µm (#200):	98.9%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 38.6%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 1.1% **M145:** A-4 Silt
Si: 98.9%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

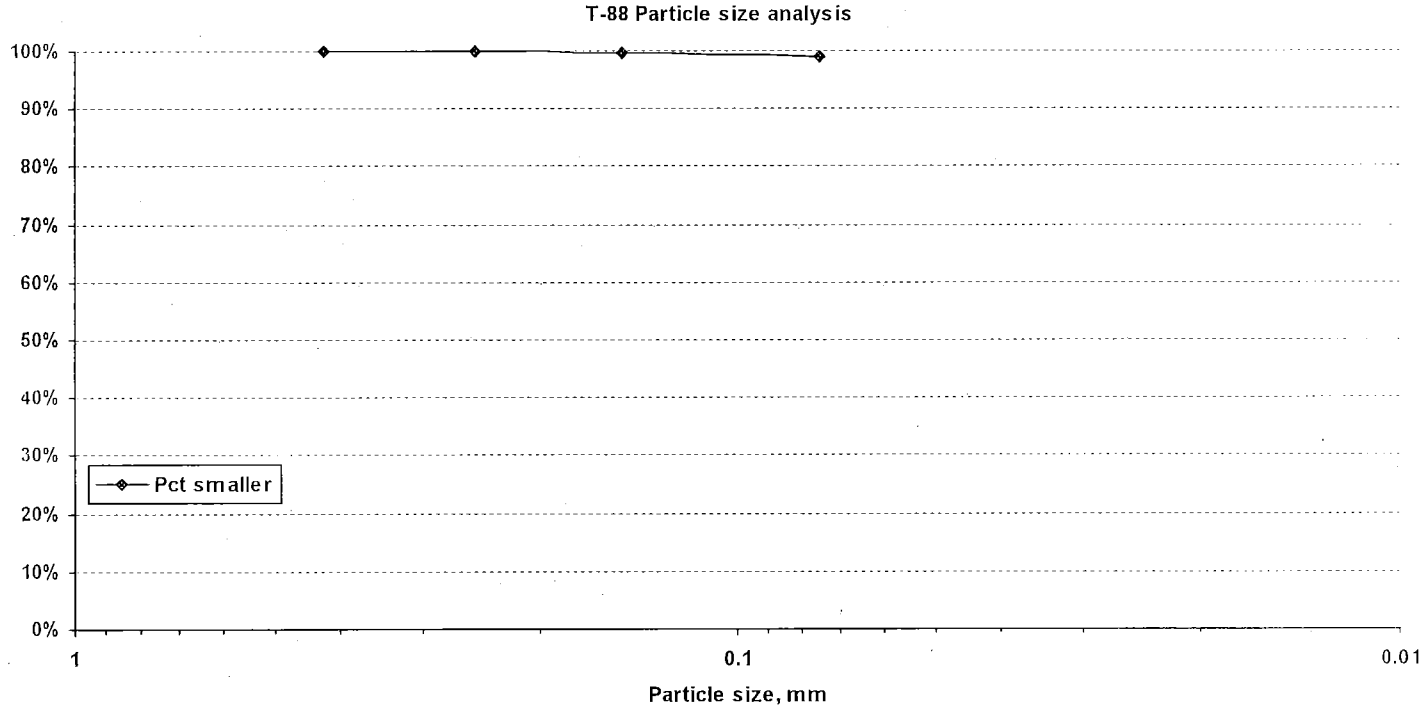
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140385 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:14:23 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 44 FT - 46 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140386 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:15:48 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 49 FT **to:** 51 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment: S-10

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	99.9%
425 µm (#40):	99.6%
250 µm (#60):	99.2%
150 µm (#100):	99.0%
75 µm (#200):	98.1%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 35.7%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 1.9% **M145:** A-4 Silt
Si: 98.1%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist

Distribution list

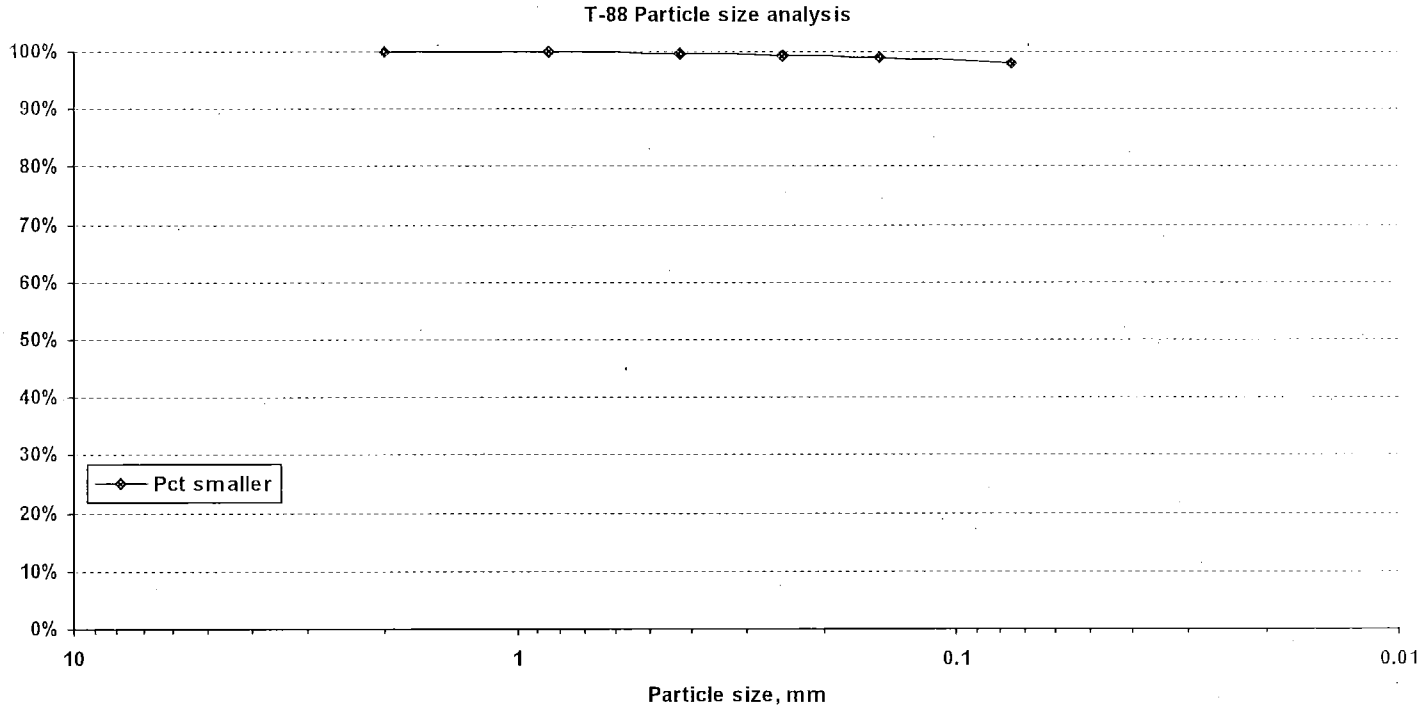
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140386 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:15:52 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 49 FT - 51 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140387 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:19:05 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 59 FT **to:** 61 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-11

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	99.5%
425 µm (#40):	99.3%
250 µm (#60):	99.2%
150 µm (#100):	98.7%
75 µm (#200):	96.6%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 33.0%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 3.4% **M145:** A-4 Silt
Si: 96.6%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

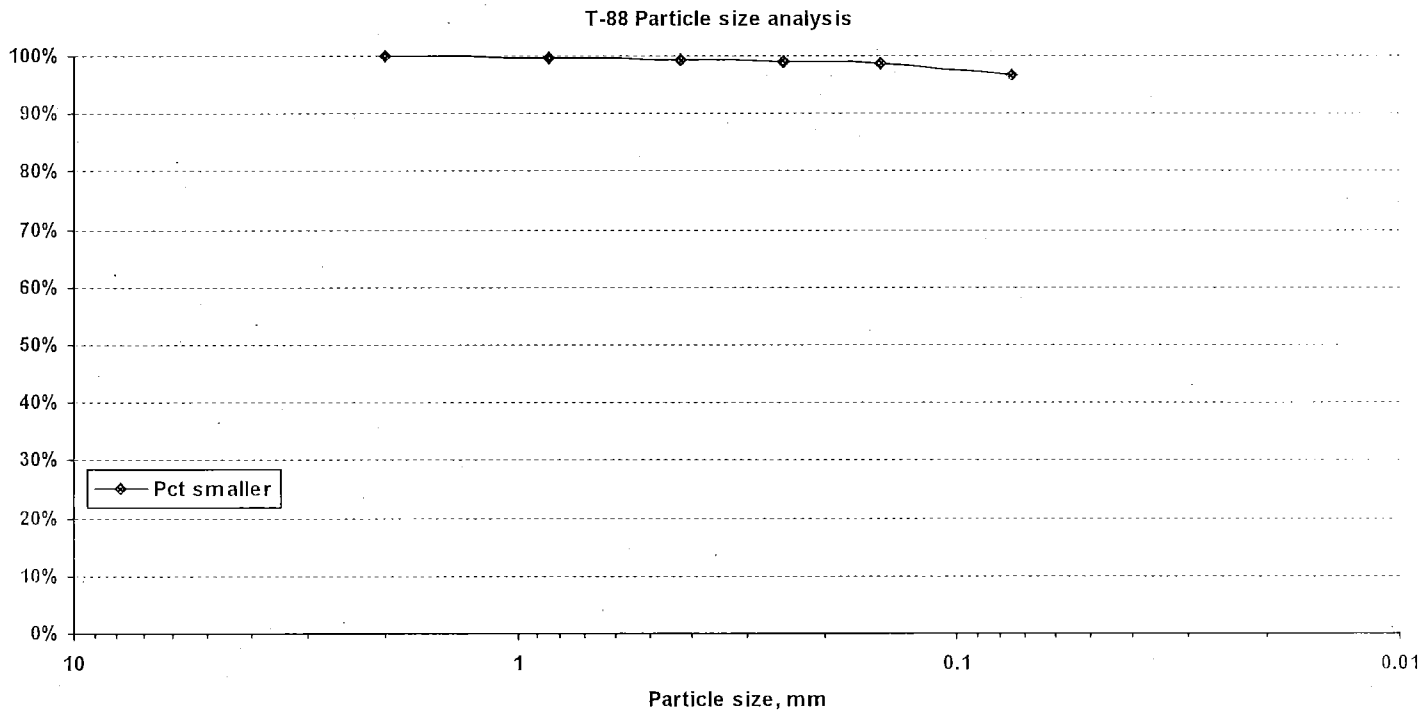
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140387 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:19:10 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 59 FT - 61 FT



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Materials and Research Section
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Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140388 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:20:20 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 69 FT **to:** 71 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-12

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	99.8%
425 µm (#40):	99.3%
250 µm (#60):	98.8%
150 µm (#100):	98.6%
75 µm (#200):	97.0%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 29.9%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.0% **D2487:** ML
Sa: 3.0% **M145:** A-4 Silt
Si: 97.0%

Comments:

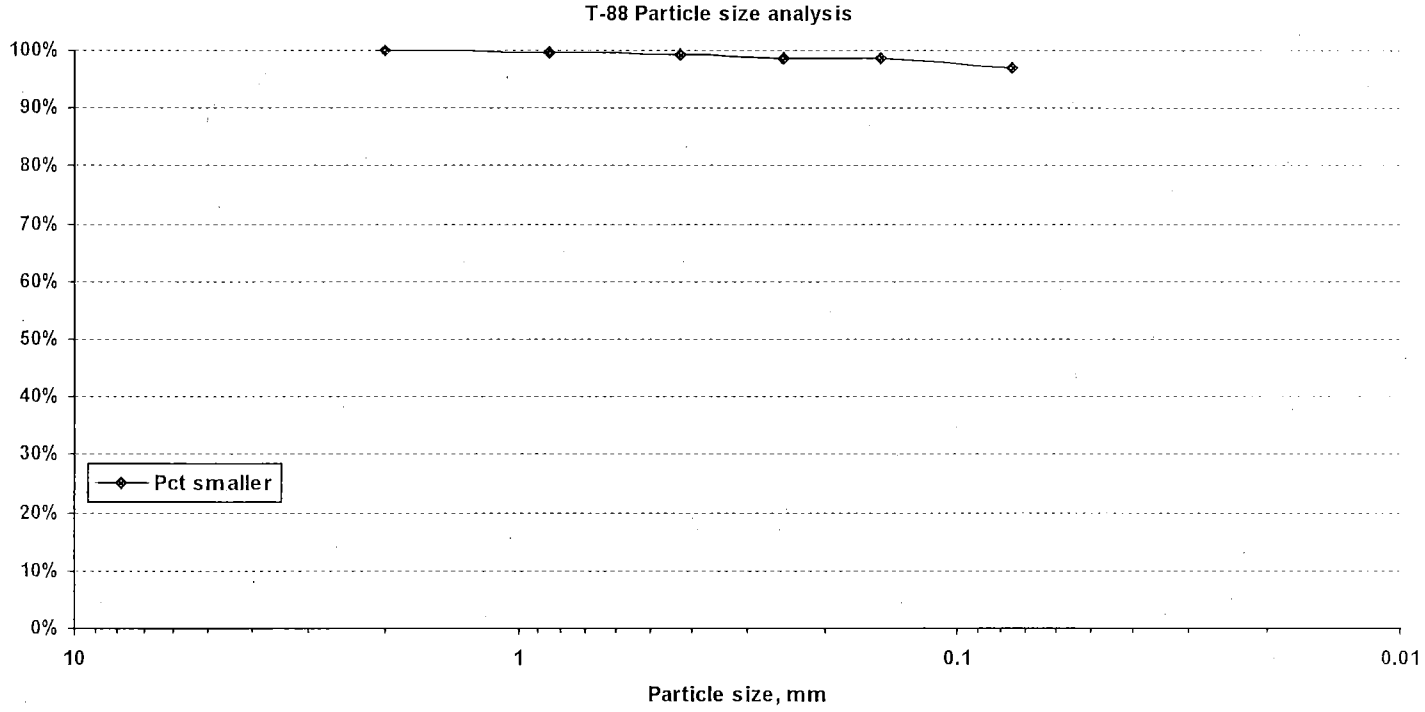
Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140388 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:20:25 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74
Hole: B-2 **Depth:** 69 FT - 71 FT



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Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140389 **Corrected copy:** N/A **Report Date:** 3/26/2014 11:26:47
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 79 FT **to:** 81 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GSH, AL
Comment: S-13

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	100.0%
850 µm (#20):	100.0%
425 µm (#40):	99.6%
250 µm (#60):	99.4%
150 µm (#100):	99.2%
75 µm (#200):	97.2%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	87.9%
0.02 mm:	41.4%
0.005 mm:	5.2%
0.002 mm:	1.3%
0.001 mm:	1.0%

Limits

T-265 Moisture content: 32.3%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity: 2.757

Gr: 0.0% **D2487:** ML
Sa: 2.8% **M145:** A-4 Silt
Si: 97.2%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist

Distribution list

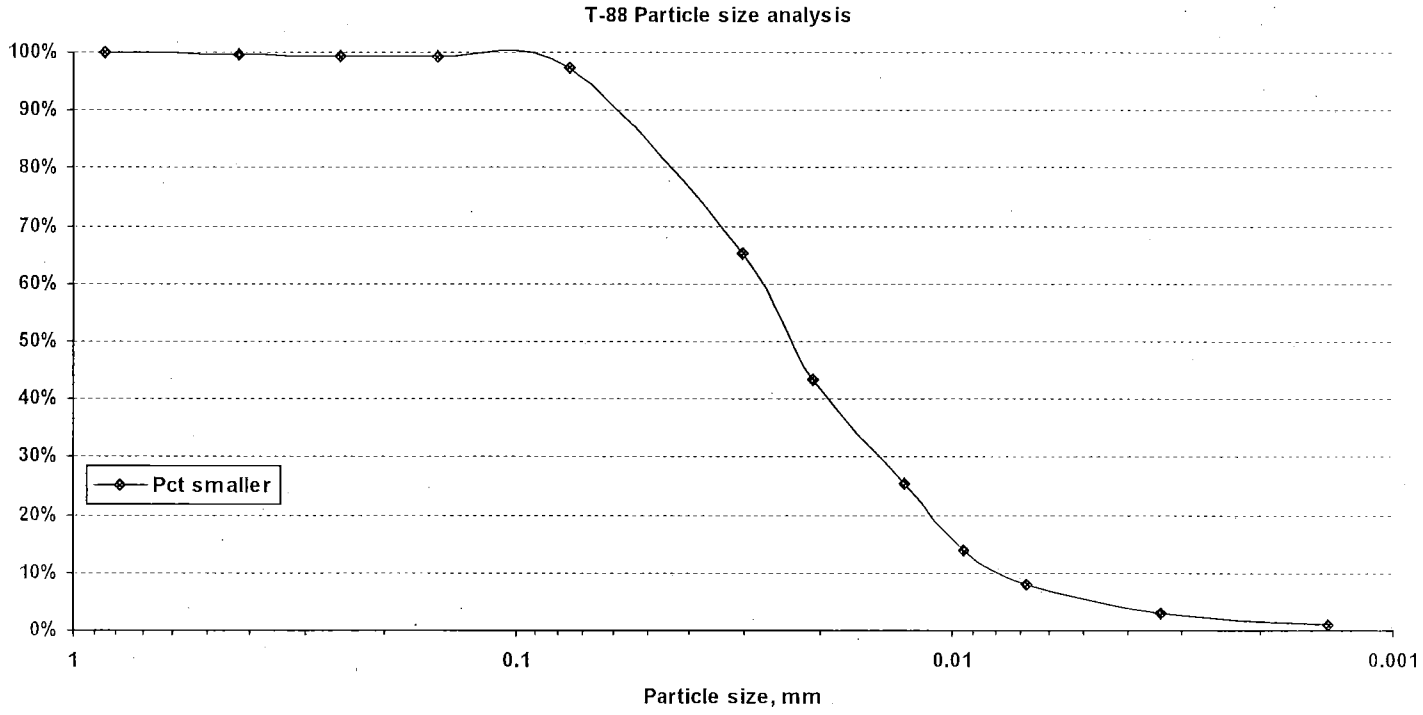
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140389 **Corrected copy:** N/A **Report Date:** 3/26/2014 11:26:52

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 79 FT - 81 FT



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Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140390 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:23:53 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 89 FT **to:** 91 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-14

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	95.0%
850 µm (#20):	93.0%
425 µm (#40):	92.8%
250 µm (#60):	92.6%
150 µm (#100):	92.5%
75 µm (#200):	91.8%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 31.9%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 5.0% **D2487:** ML
Sa: 3.2% **M145:** A-4 Silt
Si: 91.8%

Comments: LAB NOTE: SOME SMALL STONES WERE WITHIN SAMPLE.

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

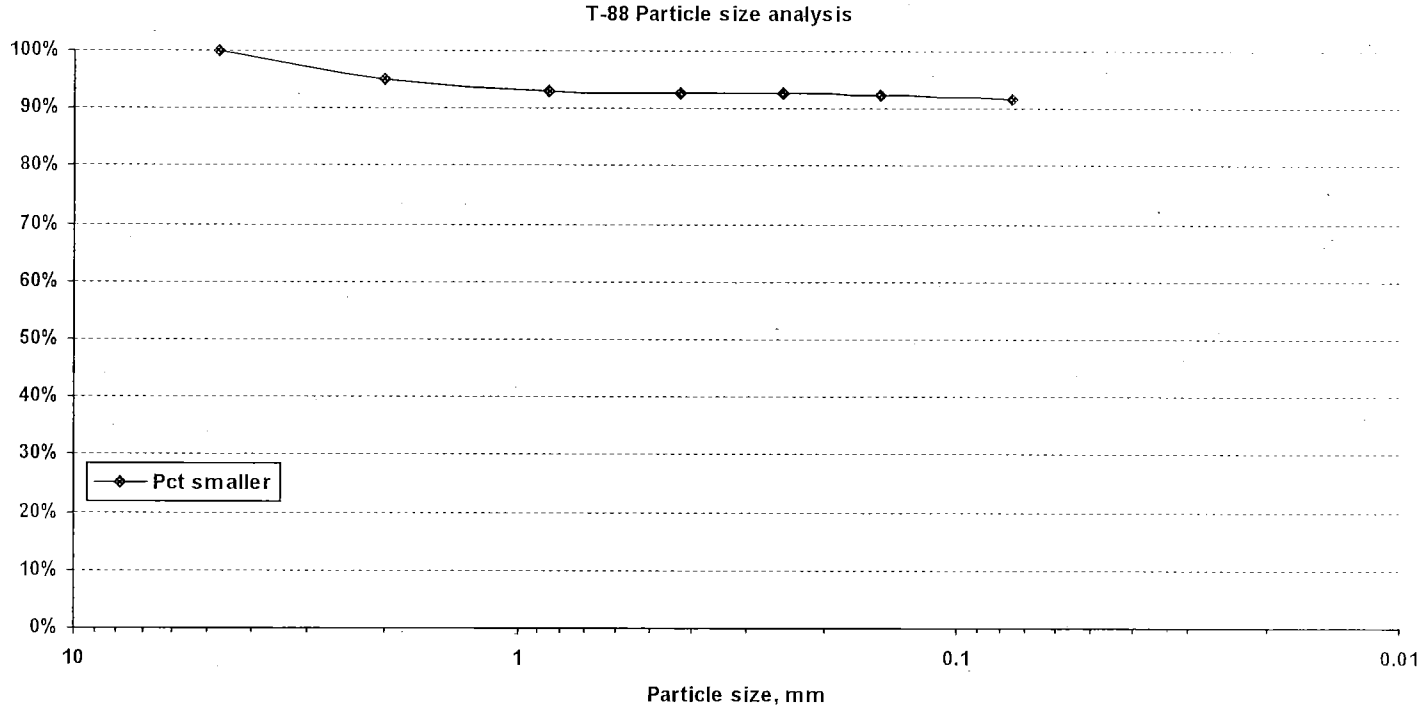
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140390 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:23:57 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 89 FT - 91 FT



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Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140391 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:25:32 P
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 3/17/2014 **Received:** 3/19/2014 **Tested:** 3/19/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2 **Depth:** 105 FT **to:** 107 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: SPLIT BARREL **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS, AL
Comment: S-15

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	99.4%
2.00 mm (#10):	99.3%
850 µm (#20):	99.1%
425 µm (#40):	98.9%
250 µm (#60):	98.8%
150 µm (#100):	98.6%
75 µm (#200):	96.4%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 29.7%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.7% **D2487:** ML
Sa: 2.9% **M145:** A-4 Silt
Si: 96.4%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist TE

Distribution list

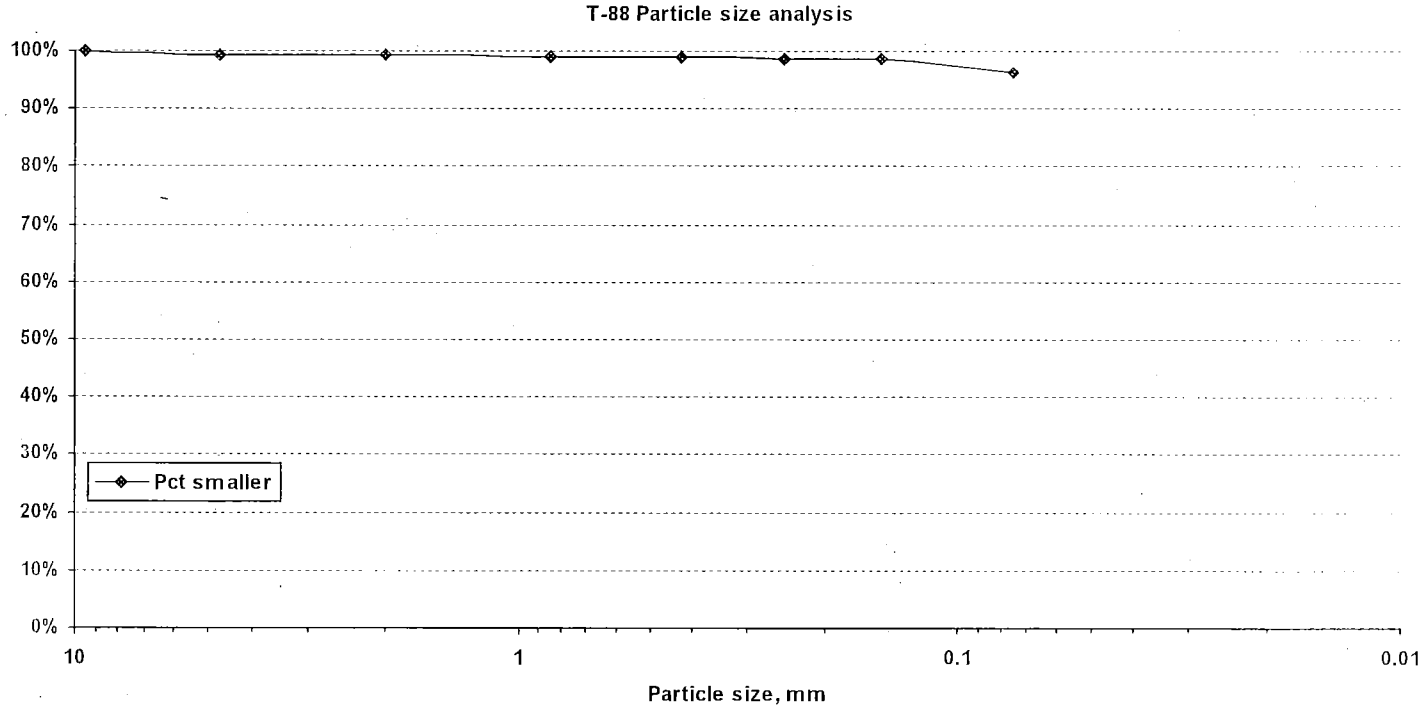
Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Report on Soil Sample

Lab number: E140391 **Corrected copy:** N/A **Report Date:** 3/24/2014 1:25:37 P

Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Hole: B-2 **Depth:** 105 FT - 107 FT



Vermont Agency of Transportation
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1 National Life Drive
Montpelier, VT 05633-5001

Distribution list
TERRACON
T. ELIASSEN
J. TOUCHETTE

Report on Soil Sample

Lab number: E140619 **Corrected copy:** N/A **Report Date:** 4/11/2014 8:50:06 A
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74

Date sampled: 4/9/2014 **Received:** 4/10/2014 **Tested:** 4/10/2014 **Tested by:** J. TOUCHETTE
Station: **Offset:** **Hole:** B-2A **Depth:** 117 FT **to:** 119 FT
Field description:
Submitted by: TERRACON **Address:**
Sample type: CASING **Quantity:**
Sample source/Outside agency name:
Location used: **Examined for:** MC, GS
Comment:

Test Results

Sieve Analysis

T-88	% Passing Total Sample
75 mm (3.0"):	
37.5 mm (1.5"):	
19 mm (3/4"):	
9.5 mm (3/8"):	
4.75 mm (#4):	100.0%
2.00 mm (#10):	99.9%
850 µm (#20):	99.8%
425 µm (#40):	99.6%
250 µm (#60):	94.8%
150 µm (#100):	76.8%
75 µm (#200):	47.9%

Hydrometer Analysis

Particles smaller	% total sample
0.05 mm:	
0.02 mm:	
0.005 mm:	
0.002 mm:	
0.001 mm:	

Limits

T-265 Moisture content: 22.8%
T-89 Liquid Limit:
T-90 Plastic Limit:
T-90 Plasticity Index: NP

Moisture Density

Test method: T-180 **Method:**
Maximum density: pcf
Optimum moisture:
T-100 Specific Gravity:

Gr: 0.1% **D2487:** SM
Sa: 52.0% **M145:** A-4 Silty Sand
Si: 47.9%

Comments:

Reviewed by: T. Eliassen, P.G., Transportation Geologist

Vermont Agency of Transportation
Materials and Research Section
1 National Life Drive
Montpelier, VT 05633-5001

Distribution list

Report on Soil Sample

Lab number: E140619 **Corrected copy:** N/A **Report Date:** 4/11/2014 8:50:15 A
Project: CALAIS **Number:** BHF 037-2(10) **Site:** VT-14 BR-74
Hole: B-2A **Depth:** 117 FT - 119 FT